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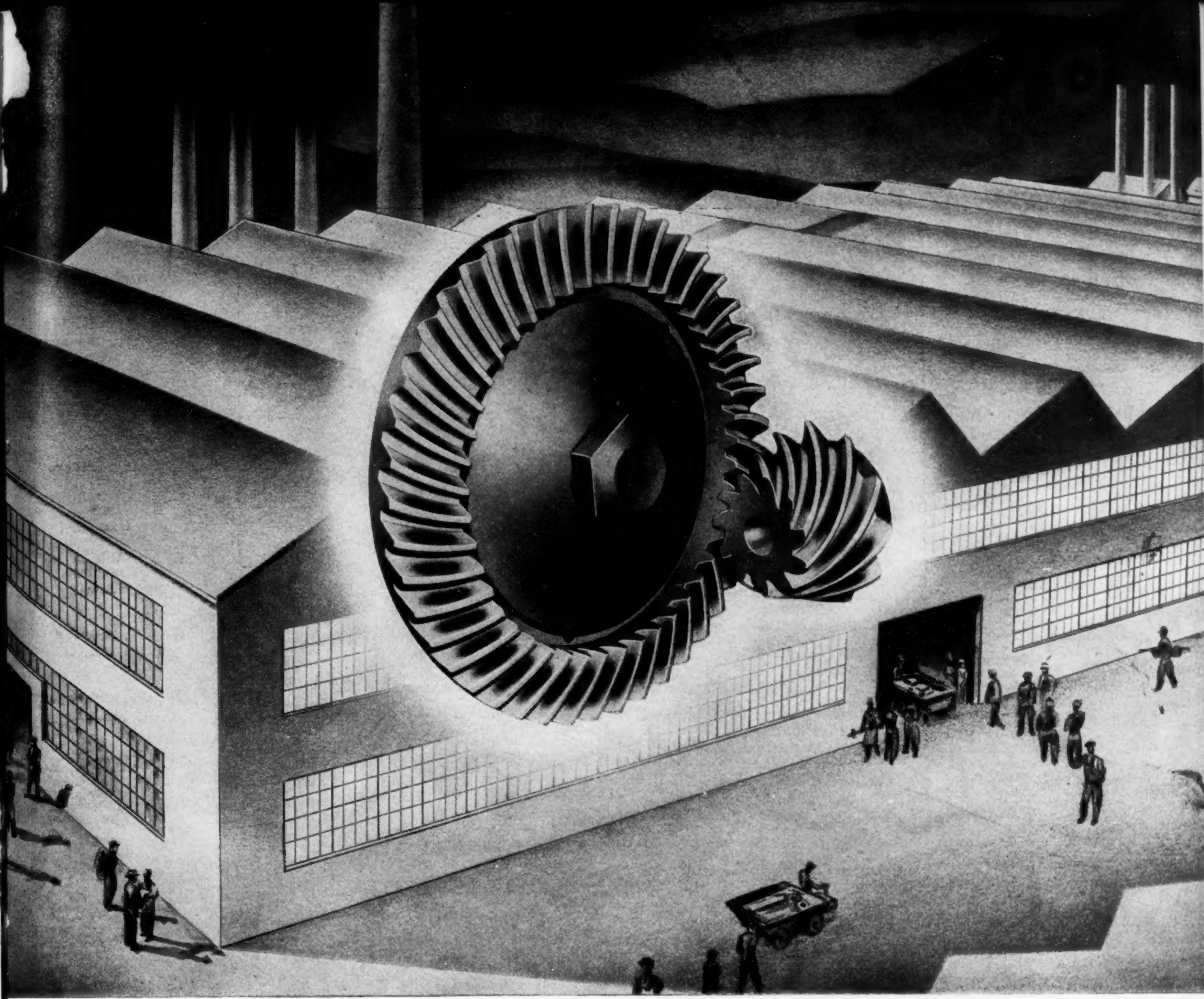
CHEMICAL INDUSTRIES

The Chemical [illegible] Magazine



The Business Magazine for Makers & Users of Chemicals

Management, Research Production, Marketing

CHEMICAL INDUSTRIES

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Volume 50 Number 3

MARCH, 1942

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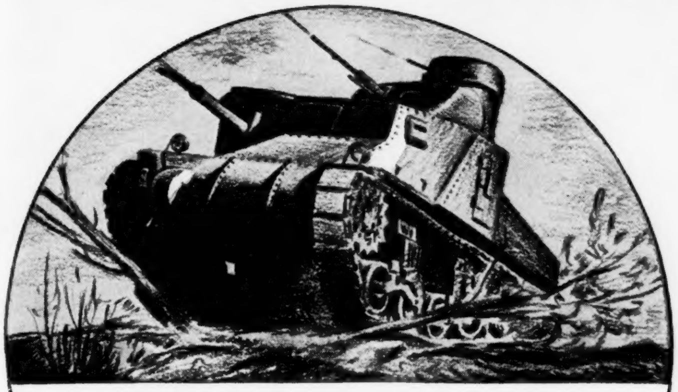
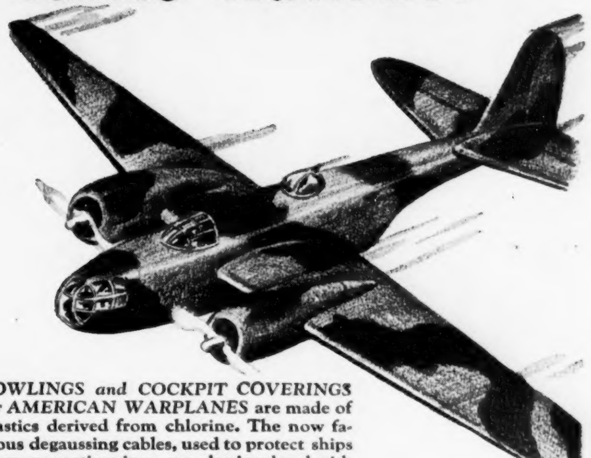
CHLORINE GOES TO WAR

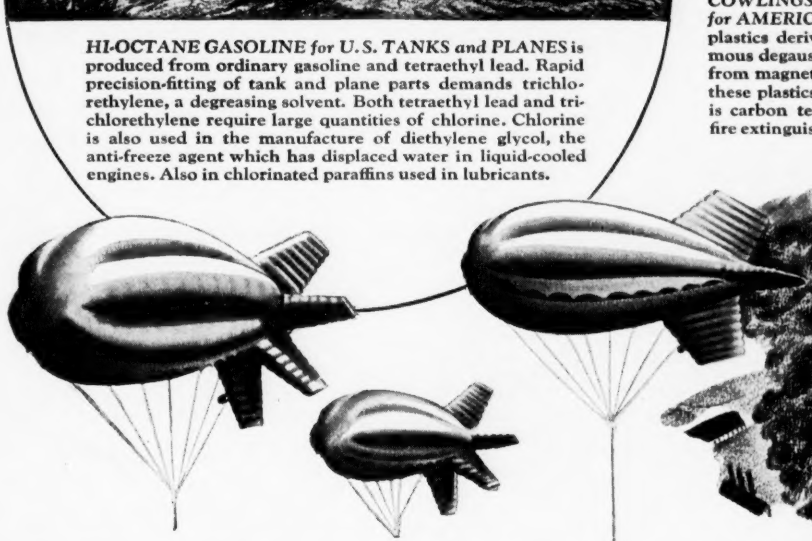
as America mans its battle stations!



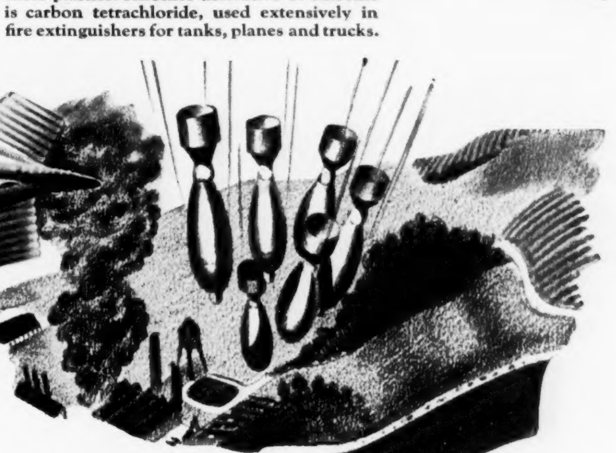
***HI-OCTANE GASOLINE** for* **U. S. TANKS** *and* **PLANES** **is produced from ordinary gasoline and tetraethyl lead. Rapid precision-fitting of tank and plane parts demands trichlorethylene, a degreasing solvent. Both tetraethyl lead and trichlorethylene require large quantities of chlorine. Chlorine is also used in the manufacture of diethylene glycol, the anti-freeze agent which has displaced water in liquid-cooled engines. Also in chlorinated paraffins used in lubricants.**



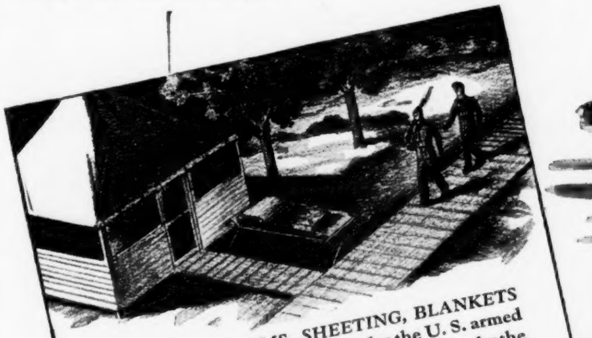
COWLINGS *and* **COCKPIT COVERINGS** *for* **AMERICAN WARPLANES** **are made of plastics derived from chlorine. The now famous degaussing cables, used to protect ships from magnetic mines, are also insulated with these plastics. Another derivative of chlorine is carbon tetrachloride, used extensively in fire extinguishers for tanks, planes and trucks.**



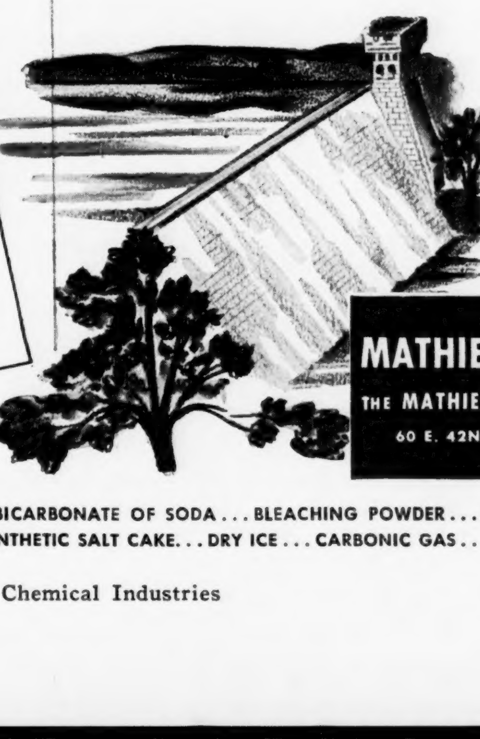
BARRAGE BALLOONS, capable of withstanding heat, gases and sunlight, are being manufactured from synthetic rubber. America's fast-growing production of synthetic rubber for protective balloons and other wartime needs has put an extra load upon the chlorine industry.



***ALL-OUT PRODUCTION** of* **MUNITIONS** **requires large amounts of chlorine, especially for processing of cotton linters for smokeless powder and other explosives.**



TENTS, UNIFORMS, SHEETING, BLANKETS and PARACHUTE FABRICS for the U. S. armed forces are being turned out in millions of units by the textile industry. Thousands of tons of liquid chlorine go into the processing of these vital war materials.



U. S. BASES *and* **ARMY CAMPS** **require large quantities of chlorine for water purification and sewage treatment. This widespread use of chlorine is in addition to large-scale requirements of state and municipal water works systems.**

MATHIESON CHEMICALS

THE MATHIESON ALKALI WORKS, (INC.)

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LIQUID CHLORINE . . . SODA ASH . . . CAUSTIC SODA . . . BICARBONATE OF SODA . . . BLEACHING POWDER . . . HTH PRODUCTS . . . AMMONIA, ANHYDROUS and AQUA . . . FUSED ALKALI PRODUCTS . . . SYNTHETIC SALT CAKE . . . DRY ICE . . . CARBONIC GAS . . . SODIUM CHLORITE PRODUCTS

THE READER WRITES

"We have ten silver months"—Donald M. Nelson

Editorial Note: Donald Nelson, WPB Chief, has stressed the immediate need for all-out conversion of existing plant capacities to war work. How can the chemical manufacturer or the specialty manufacturer fit into this program? In an effort to crystallize some specific information the following letter was sent to Kenneth Tator, a former chemical engineering consultant and until recently author of the regular monthly feature in *Chemical Industries* "Between the Lines."

January 21, 1942

Mr. Kenneth Tator
Office of Production Management
Bureau of Industrial Conservation
Social Security Building
Washington, D. C.

Dear Mr. Tator:

I was at a meeting yesterday at which three representatives of the New York Office of Production Management discussed priorities, allocations, etc., with approximately 100 men from the chemical and allied fields. It was a clinic held under the auspices of the Commerce and Industry Association of New York, which is a part of the Merchants Association of New York City.

I was very much impressed with the number of men who brought up the following questions, and this is the way most of them summarized the situation:

"I have a small chemical plant manufacturing either industrial chemicals or chemical specialties. I have a certain amount of miscellaneous process equipment. I am having extreme difficulty in getting raw materials to manufacture my regular line. What can I make for the government that is needed in defense?"

People of this type require, I believe, this kind of information:—

1. A fairly complete list of the various products that the government is anxious to have produced for war purposes—limited, of course, to materials chemical in nature.
2. Any information that can be given to them about how to re-arrange their existing process equipment.
3. Specific information as to government experts who can co-operate with them to this end.

This is all information of very practical value both to the government and to the manufacturers who are now bewildered, and who are afraid that they will be forced out of business entirely unless they can make some specific contribution in the manufacture of essential war products.

Could you or some one else in your department prepare such an article for *Chemical Industries*, assuming that you think it is a good suggestion after discussion among your colleagues?

Cordially yours,
WALTER J. MURPHY,
Editor

The Reply

Dear Mr. Murphy:

Your letter of January 21, addressed to Mr. Kenneth Tator has been placed in my hands this morning.

The contents of your letter and the ideas expressed therein are very pertinent. The Chemical Branch of the Materials Division, under the direction of Dr. E. W. Reid, has created a section known as the Plant Facilities Section, the purpose of which is to ascertain the idle equipment existing throughout the country or equipment now being used for non-defense or non-essential purposes, that might be diverted to direct defense needs.

This Section has only started to function in the last two days and, as rapidly as possible will accumulate

1st. Information as to where such equipment exists.
2nd. A list of chemical products needed for defense purposes.
3rd. Attempt to see that such idle equipment is placed in line of production for these critical items.

In view of the fact that this Section has so recently started functioning, there is not sufficient information available as yet to justify the preparation of an article such as you request. However, in as brief a time as possible, such article would be very helpful if it could appear in magazines of your type, and I hope you will keep it in mind and take it up with us a little later.

In the meantime, it would be very helpful if the information was disseminated throughout the various trade channels, such as your magazine, that this Section now exists. If plants having available equipment would list them with this Section and also indicate to what possible use they might be put, it would be very helpful in speeding up plant conversion to war needs. Whenever a need for some chemical product develops we could then take it up with these various plants if the facilities that they had on hand were on file with this office.

C. T. Thompson,
Chief, Plant Facilities Section,
Materials Division,
Chemical Branch,
War Production Board,
Washington, D. C.
Room 2430, Temporary R.

COMING IN EARLY ISSUES

Lime as a Chemical Raw Material

The Balance Sheet In Oils and Fats

Plastics as Linings In Process Equipment

Rare Chemicals' Position

I am referring to the article "Hormone Trust Broken," which appeared on page 81 of the *Chemical Industries*, January, 1942 issue. It seems to me that through this article in respect to the action brought by the Federal Government against several pharmaceutical and chemical organizations, including ours, the public might well misapprehend the situation with regard to this company. I desire to correct such a misapprehension.

I am President of Rare Chemicals, Inc., of Flemington, New Jersey, am an American citizen and Rare Chemicals, Inc. is wholly American owned. The fines that were assessed in the Government suit against me and this company were suspended by order of the Court at the suggestion and on the recommendation of the Government officials. Rare Chemcals, Inc. was drawn into the suit because it has a license from one of the other named defendants who manufacture certain hormone products.

In its answer in that suit this company denied all of the charges of the Government, but entered into the consent decree because of its desire to co-operate with the Government which is seeking to eliminate any monopolistic practices in the industry.

Rare Chemicals, Inc. has no relationships or connections with regard to this matter in South America or other European countries and has not made any sales which in any way have benefitted any of the Axis powers.

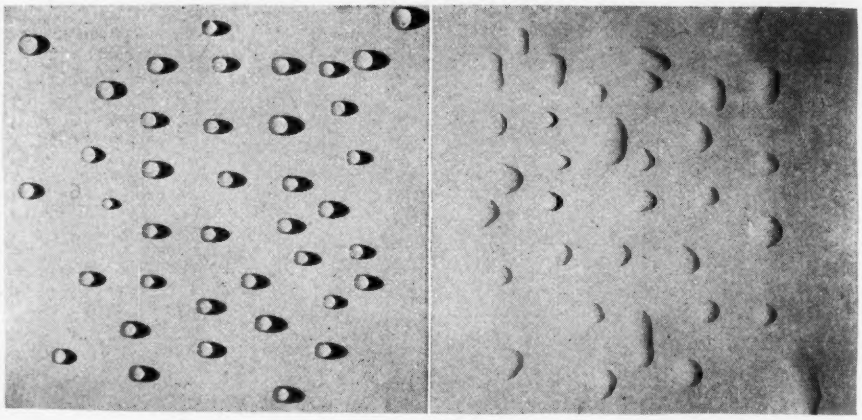
As to other chemicals and hormones manufactured by Rare Chemicals, Inc., this company has a totally independent position and is not connected with any of the other companies named in this action or with any other European country.

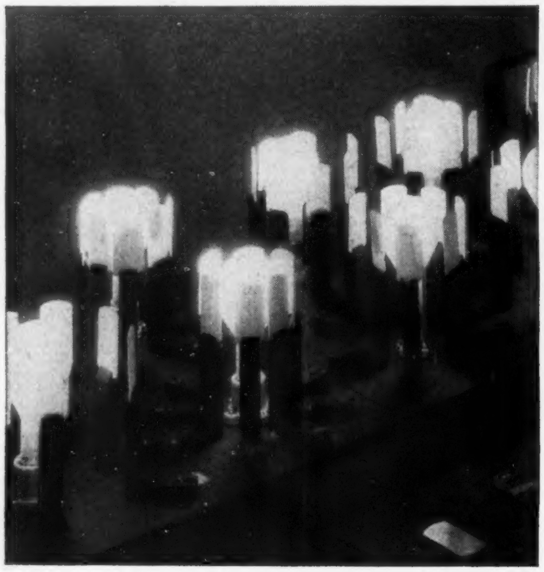
Immediately upon the declaration of this war emergency, Rare Chemicals, Inc. made available its total facilities for national defense work and has otherwise co-operated with the Government and is to do so on an ever increasing scale.

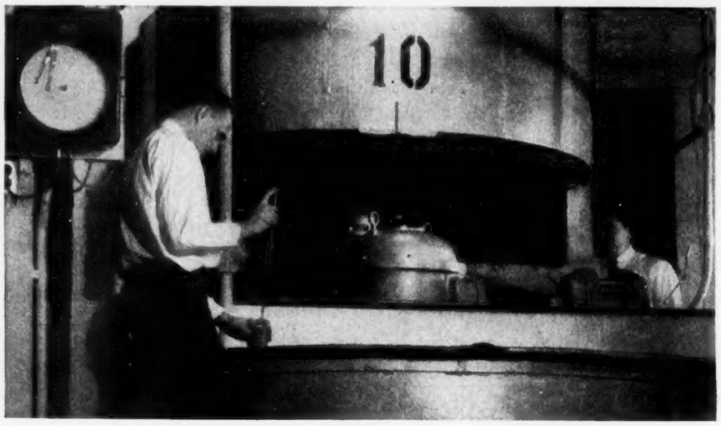
E. T. Fritzsching,
President, Rare Chemicals, Inc.,
Flemington, N. J.

LIFE On The

(*Right*) **PAPER TREATMENT** with wax emulsions developed by Cyanamid may be used to advantage in many cases to replace dry waxing, particularly when heavy coats are not needed. When emulsions are used, the wax may be applied at the machine, eliminating an extra operation. Paper is not discolored as in dry waxing, and penetration is better controlled. Water-soluble modifying ingredients may be used, and the application of wax emulsions does less injury to resistance to hot aqueous liquids than does dry waxing. Effects secured by paper machine treatment with wax emulsions are capable of wide modification. Unretouched photographs show results of treatment: (*left*) "duck's back" effect of paper treated with Alwax size; (*right*) paper which has not been treated with this material.







(*Above*) **LARGE-SCALE PRODUCTION FACILITIES** at its Charlotte Plant are typical of those utilized by Cyanamid for the manufacture of textile chemicals. These facilities enable Cyanamid to maintain uniformly high quality, and to give prompt delivery of such products as sulfonated oils, wetting agents, sizing compounds, and other widely used textile specialties.

(*Above*) **RIGID HEAT TESTS** on BEETLE* plastics determine the relation between time of exposure, temperature, and other factors. These factors are particularly important in view of BEETLE's extensive use in lighting reflectors, where its light weight, shatter-resistant properties, and excellent light transmission and diffusion are especially desirable features.

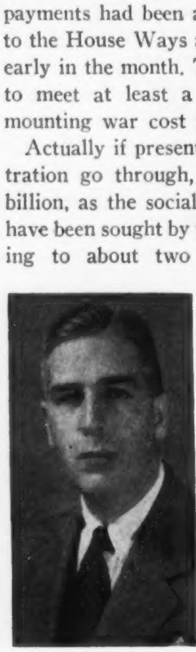
(*Right*) **REFRACTORY CEMENTS** and clays, for foundries and similar applications, show improvement in working qualities as a result of adding AEROSOL* Wetting Agents. Full details on the properties and methods of application of these exceptionally powerful wetting agents are contained in a 78-page book, which is available on request on your letterhead.

WASHINGTON

By T. N. Sandifer

THE Administration 7-billion dollar tax bill will be well on its way through Congress as this appears. Originally scheduled to be withheld until after current tax returns from March payments had been analyzed, it was given to the House Ways and Means Committee early in the month. The plan is to attempt to meet at least a third of the rapidly mounting war cost from current revenue.

Actually if present plans of the Administration go through, the tax will be nine billion, as the social security levies which have been sought by the President, amounting to about two billion dollars, will, according to present schedule, be incorporated in separate legislation to follow the general tax bill.



T. N. Sandifer

Before this appears the Secretary of the Treasury will doubtless have advanced his request, on behalf of the President, for revision upward of the statutory limitation on the national debt. The new limit mentioned is 100 billion dollars instead of the present 65 billion. The reason is easily obvious.

Authorized expenditures for the present American war effort, including foreign orders, through February 15, 1942, aggregate, with pending appropriations for this purpose in Congress, an estimated \$145,400,000,000. These figures are the latest from War Production Board analysts, who are certainly in the best position to know.

Nevertheless, it is a mistake to assume, as some have, that the public flare-up in recent weeks, termed by some as a "going-over" by the people of both the Administration and Congress, is a public reaction against spending, as such. It was not aimed at war-spending so much as it really constituted a warning of public restiveness to see some effective results from this spending.

It was noticeable in Washington, if not over the country, that just after the unsavory O. C. D. episode, which ended in the withdrawal of Mrs. Roosevelt from her post there, and the only superficially comical "Bundles for Congress" movement of some time ago, that there was less mouthing of the charge of "complacency" against the public. There is a growing realization by this time that what Washington thought was complacency was instead, public patience. But it is manifestly shorter than it was.

"Production Now"—Nelson

One result of a realization in Washington of this changed state of mind in the country is less talk, in the Churchillian manner, of the long years ahead, when American might will finally assert itself. There is instead, an increasing emphasis, particularly around the War Production Board of a new slogan attributed to Donald Nelson, "Production Now" which will be heard oftener in the months to come.

Inaugurating a new program of even greater production of aluminum, designed, with imports anticipated at half a billion pounds annually from a simultaneous expansion of Canadian production, to give this country sufficient metal for the 1943 goal of 125,000 combat planes, William L. Batt, chief of the Materials Division of the WPB, announced also a definite policy of not counting cost ahead of results. Not that anybody has conspicuously reckoned cost of anything done in Washington, but this statement at least formalizes the policy, and couples it with the word "results."

Nelson has recently indicated that in the coming weeks and months there will be tangible results in the drive to get production of essentials for the war effort during the early part of the present year, instead of continuing to look to 1943 as the crucial period of attainment. He has come out, apparently for making the effort now instead of a year from now.

All of which is not without some political implications, even though it can honestly be ventured that politics is not in the back of Mr. Nelson's head. It is in some other people's though. While it is too early to go into that phase of national affairs some sidelights with great potentialities are visible; one is that vote-conscious members of Congress already are uneasy over public reaction to drastic new tax proposals. Another is a war phenomenon. Vast elements of the population are shifting in the war emergency—what will be the effect of this scrambling of hitherto-fixed blocks of public sentiment, lodging in otherwise formerly stable communities, politically speaking? It is an interesting subject of speculation.

Returning to more specific problems, final effectuation of the Price Control bill, despite some objectionable features, has been followed with the word by Leon Henderson, Price Administrator, that price schedules in effect since the establishment of OPA, in April of last year, will remain in effect, and henceforth price control orders by his agency will take one of two forms—maximum price regulations, similar to price schedules already familiar, and temporary price regulations which will be operative for 60-day periods.

Undoubtedly a number of changing price schedules and amendments to come will be primarily to confirm earlier schedules with the general lines of the formal Price Bill, now that it is law.

Another development now in progress at WPB concerns dollar-a-year men, so-called. With considerable unfairness to many of these, a fairly open campaign has been waged by certain Washington elements, in which these are always the butt of any currently unpleasant situation.

It cannot be alleged that the present WPB policy is directly in harmony with this attitude, but certainly appears to recognize it. Under General Administrative Orders 4 and 5, signed by Nelson, each division head must report in the near future, or during the present month, the name of every member of his unit who can continue to be carried on a dollar-a-year basis, in accord with very strict limitations set forth in the orders. Others not coming within such limits are either to return to their civil-life posts, or be transferred to some salaried position.

Reid Takes Command

It is obviously not in such connection however, that the long-expected change in the office of Chief of the Chemicals Branch has occurred. Dr. Edward W. Weidlein, of Pittsburgh, has been on loan from the Mellon Institute there, since the organization of the Chemicals Branch, serving without pay as its chief during its difficult formative period. He was never able to completely abandon his responsi-

(*Continued on Page 369*)

FROM THE ORIGINAL, PAINTED ESPECIALLY FOR NIAGARA ALKALI COMPANY BY MELBOURNE BRINDLE

STRAIGHTER and smoother runs the road when lanes meet to form a highway. For more than three decades the roads taken by Niagara Alkali Company and Electro Bleaching Gas Company ran parallel but remained separate. Today they are united—the two organizations have become one. Smoother service to the customers of each is the result. And the combined manufacturing resources, personnel and research facilities provide a broad highway upon which the new organization can move ahead into a broader sphere of activity. Forward-looking, progressive, and experienced, this company is now known as the NIAGARA ALKALI COMPANY.

EBG Niagara Alkali Company

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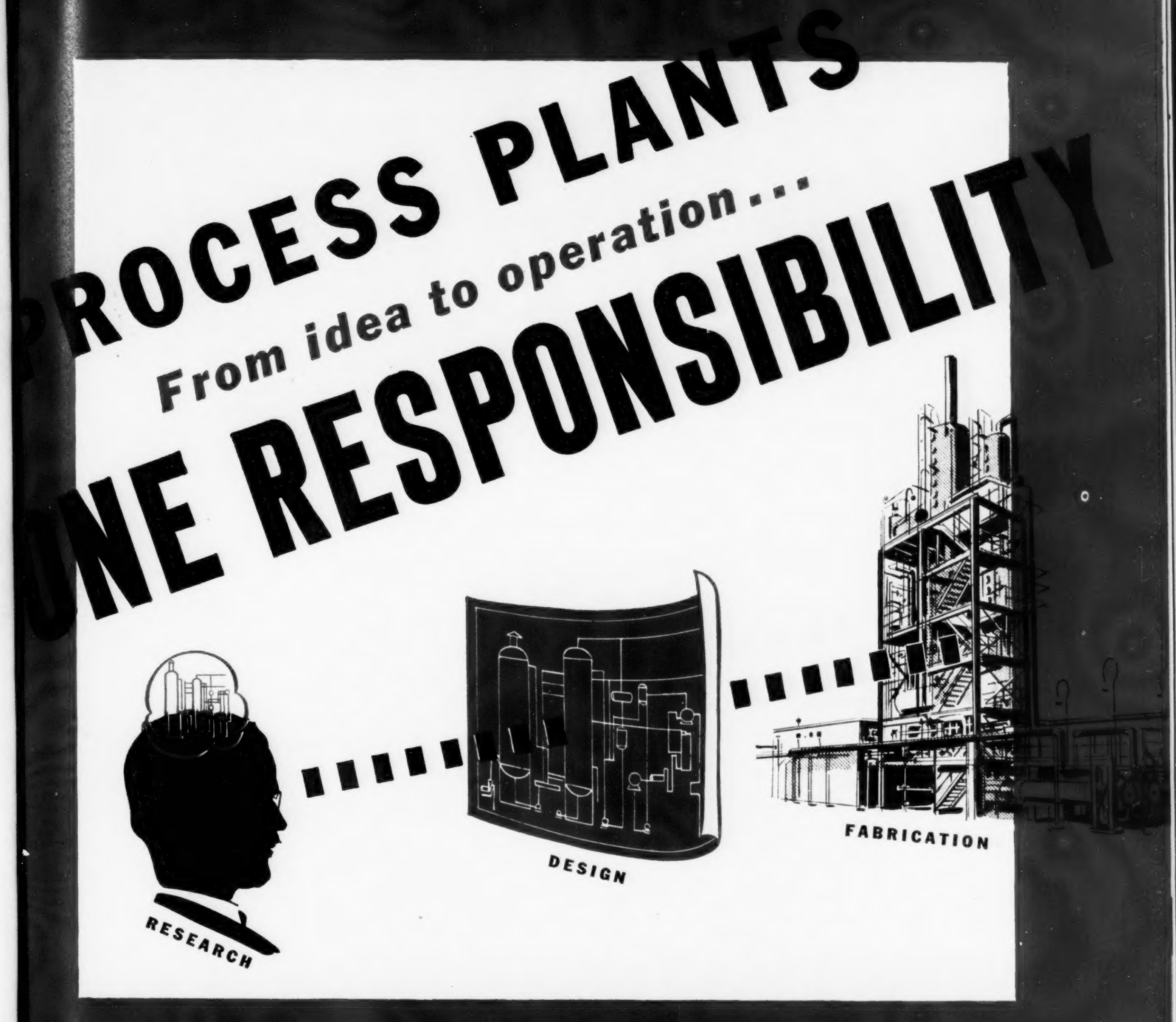
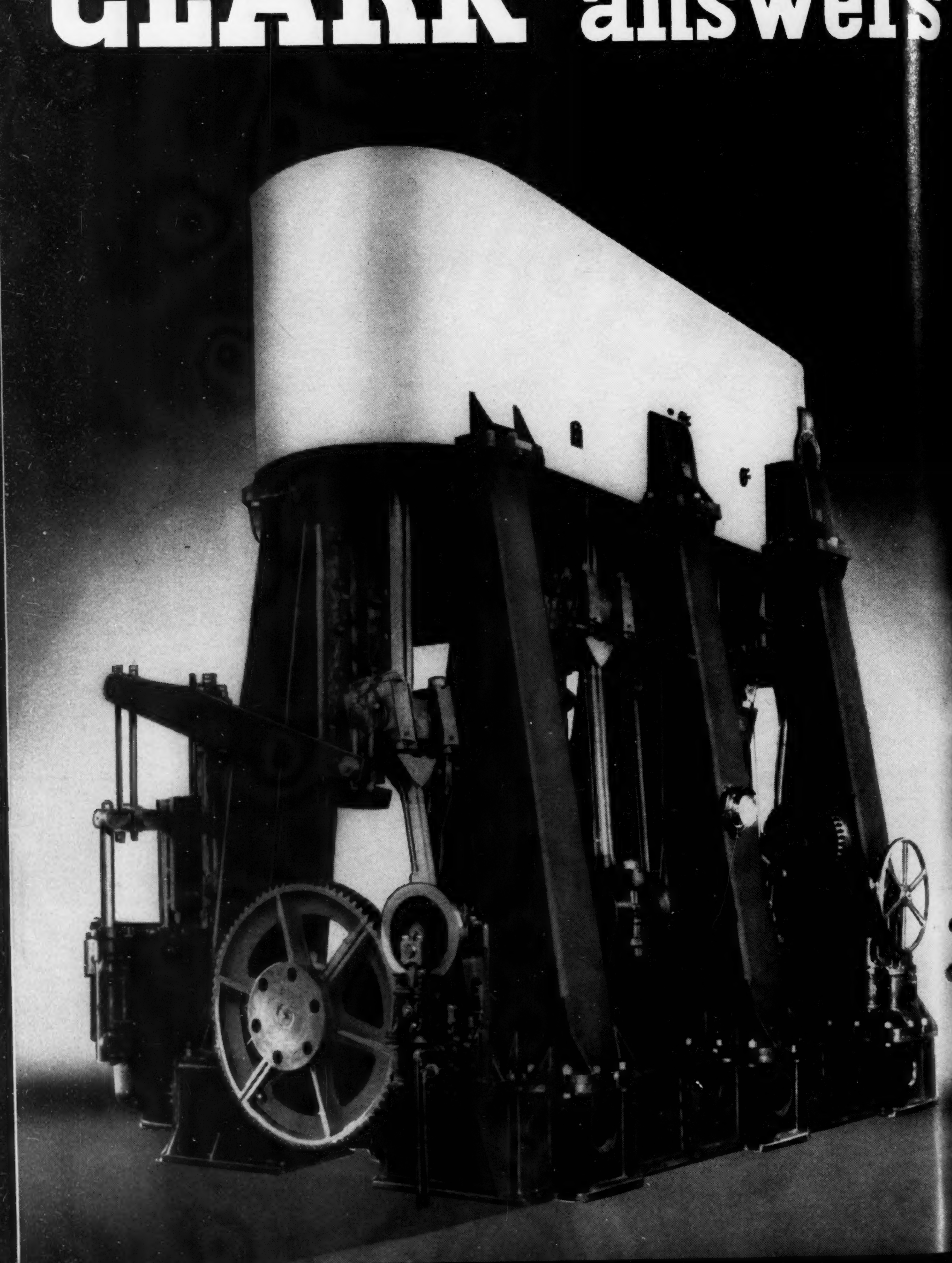
CAUSTIC POTASH · CAUSTIC SODA
PARA · CARBONATE OF POTASH

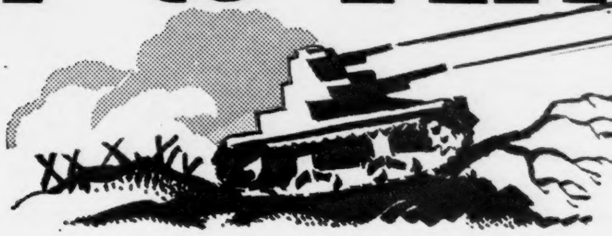
Liquid Chlorine


PROCESS PLANTS
From idea to operation...
ONE RESPONSIBILITY
RESEARCH
DESIGN
FABRICATION

CLARK answers th



s the Call to Arms!

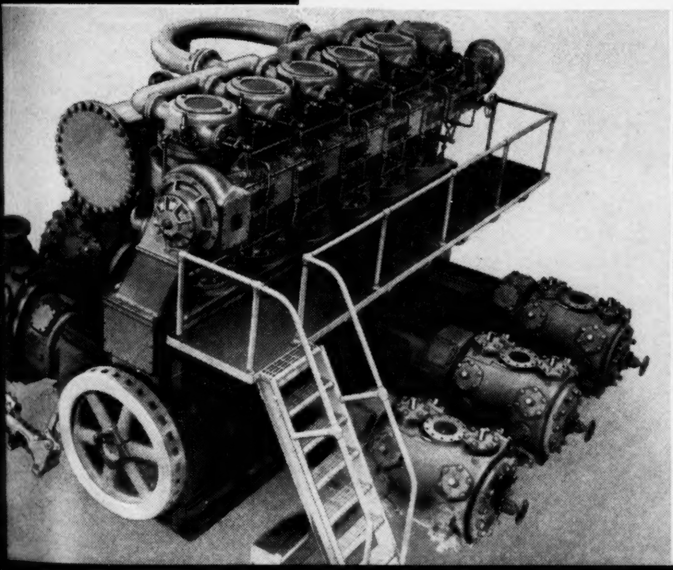


AT A TIME when many believe that Democratic ideals are engaged in a fight to the death with the powers that oppose them — CLARK has felt it a tremendous privilege to be able to place its technical knowledge, training and facilities at the disposal of the Government of the United States.

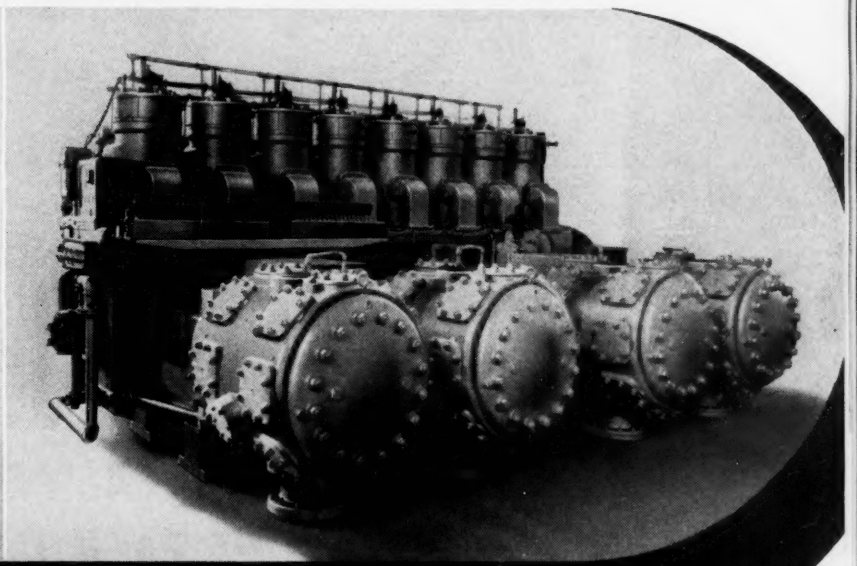
CLARK'S major defense assignment to date has been the manufacture of the Triple-Expansion Marine Steam Engine shown at left. This is similar to the units that CLARK built during the previous war. You can judge from the photograph on the opposite page the size of this huge machine. These engines are being built in the new 200-foot extension to the Olean plant.

CLARK is also building for the High Octane Gasoline Program their Standard Two-Cycle "Angle" Gas Engine Driven Compressors. To increase production of these compressors, new machine tools have been installed, production lines have been increased and all facilities and resources are being directed toward speeding up this very important program.

In addition to the above, CLARK is building for the Chemical Industry large High Pressure "Angle" Steam Engine Driven Compressors in sizes up to 4000 horsepower for compressing nitrogen and other gases used in the manufacture of explosives.



CLARK 3,000 H. P. Steam Driven "Angle" Compressor, now in service in ammonia synthesis plants



CLARK 800 H. P. Gas Driven "Angle" Compressor, now aiding in manufacture of 100 Octane Aviation Gasoline

Clark Bros. Co., Inc., Olean, N. Y. Export Office: 30 Rockefeller Plaza, New York. Domestic Sales Offices and Warehouses: Tulsa, Okla.; Houston, Tex.; Chicago, Ill. (122 So. Michigan Ave.); Boston, Mass. (131 Clarendon St.); Huntington Park, Calif. (5717 Bicket St.) Foreign Offices: 72 Turnmill St., E. C. 1, London.

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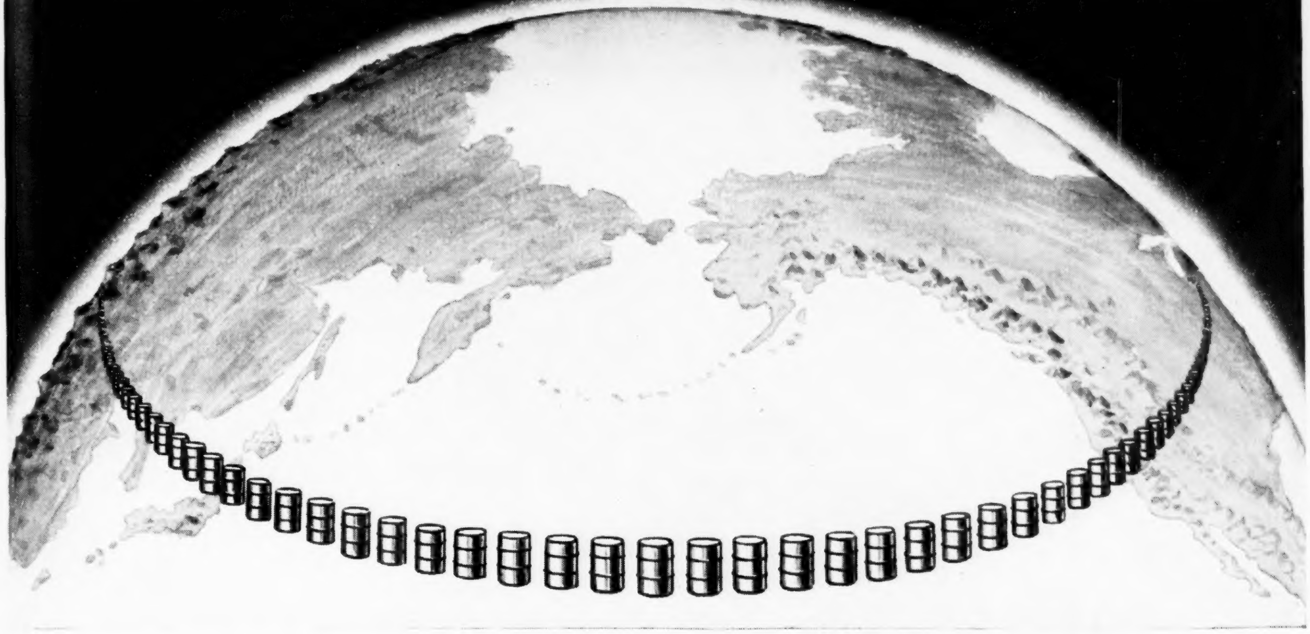


3,000 DRUMS IN 48 HOURS
for an overseas war emergency

TO meet an emergency schedule, timed to get war supplies moving fast across the Pacific, Wilson & Bennett were asked to deliver 3000 steel drums (10 carloads) within 48 hours. A large order, but it was filled in addition to regular schedules. Only a production capacity geared to war emergencies could meet this demand.

Wilson & Bennett are ready at all times to use this production capacity to meet emergency requirements in the chemical industry.

The greater protection furnished by steel containers becomes almost a necessity for the safe transportation of chemicals where shipping and storage problems are on a world wide basis.

Steri-Seald

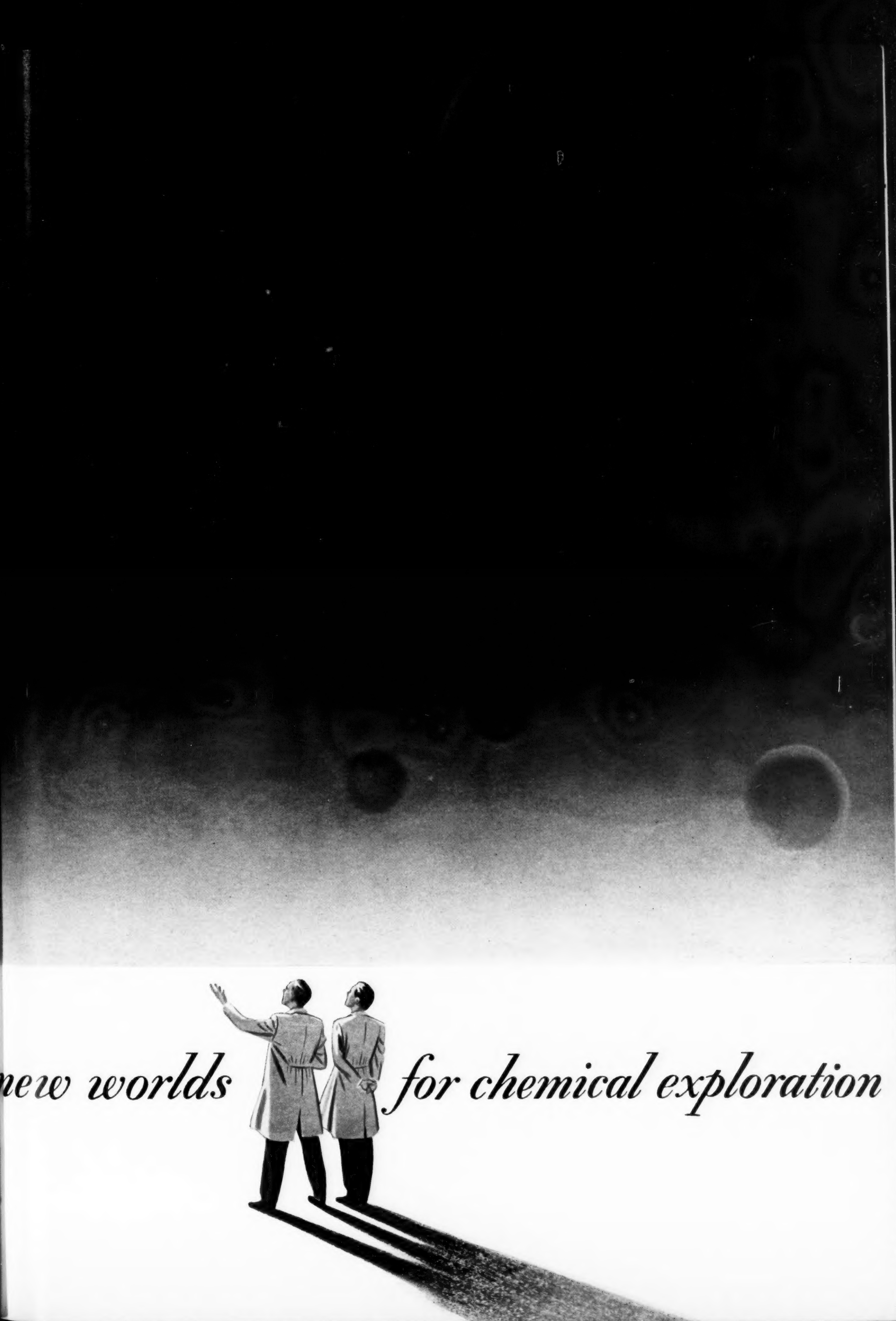
TRADE MARK REG. U. S. PAT. OFF.

lined steel drums and pails are provided for the more delicate chemicals that need the added protection of a specially lined container. Lining materials are tested for each product under actual filling and storage conditions to develop a safe interior that will preserve all the original freshness and purity of sensitive chemicals during shipment.

Made in 3 Gal. to 5 Gal. Capacities.

WILSON & BENNETT
Steri-Seald
TRADE MARK REG. U. S. PAT. OFF.
LINED STEEL CONTAINER
JERSEY CITY • NEW ORLEANS
CHICAGO
No.

WILSON & BENNETT MANUFACTURING CO., CHICAGO, ILL.
Subsidiary of Inland Steel Company
Plants at Chicago, Jersey City and New Orleans • Warehouses in all principal cities
Makers of Steel Drums and Pails


S new worlds for chemical exploration

LAST MINUTE
NEWS AT PRESS
TIME DIGESTED
FOR C.I. READERS

CHEMICAL INDUSTRIES

CHEM-O-GRAM

WASHINGTON
PRICES
PRODUCTION
PERSONNEL

IMPORTANT

A Specific Plan For Greater All-Out Production

War Production Board has just released official Plan Book for the Production Drive. Objective of the drive, which is not a short-time drive, but for the duration, is to meet the war production quotas set for American industry by the President as essential for victory over the Axis. If you have not received one of these Plan Books write or wire Robert W. Horton, Director, Division of Information, War Production Board, Washington, D. C.

PRICES:—WPB announces that one producer of titanium pigments, American Zirconium Corp., Baltimore, will be permitted to charge 1 1/2¢ a pound above the maximum price until May 2. Sulfur chloride "upped" 1/4¢. Mesityl oxide, methyl isobutyl ketone are two other items advanced.

RATIONING:—Gasoline rationing is said to be just around the corner. Fuel oil problem is acute. Coal consumers are urged to place orders for immediate delivery. No coal shortage but transportation may become a bottleneck.

EXPLOSIVES LICENSING:—March 16 was the deadline for any person or firm making, distributing, storing, selling, issuing, transporting or using explosives or ingredients of explosives without a license. A number of well-known chemicals are included in the list of "ingredients."

TOLUOL:—Standard of Indiana, Texas Co., and Socony-Vacuum to produce toluol.

JOBLESS FUNDS:— Senate Finance Committee has been asked to revise Federal tax laws to permit setting up of funds to be used as severance pay for workmen who, at the end of war production activities, will lose jobs.
In a letter to Senator Bennett Champ Clark (Dem., Mo.), Edgar M. Queeny, president of Monsanto, pointed out his company would like to establish such a reserve, particularly for the employees of four large new plants which the company will operate for the Government.
But, he said, under present tax laws money set aside by stockholders to give severance pay to dislocated employees would be penalized to the extent of 72%, with even higher penalties in prospect.
He suggested that if the tax laws were revised to permit setting up reserves of severance pay funds that such funds could be deposited irrevocably with a trust company, which would act as a third party to see that the money could not be used for any purpose other than severance pay.

WASHINGTON:—Seeking to conserve supplies and direct the distribution of wood pulp the WPB on March 13 placed entire wood pulp industry under an allocation system, effective May 1. Rhodium is out of jewelry for duration. A Corn Products Section in the Food Supply Branch of WPB announced with A. E. Staley, President, A. E. Staley Manufacturing Co., as Chief.

PERSONNEL:—Houlder Hudgins has been named director of the Division of Purchase of WPB. He succeeds Douglas C. MacKeachie who now is assisting Chief of Army Supply. Leo T. Crowley, Chairman, Federal Deposit Insurance Corp., has been named Alien Property Custodian. Secretary of the Treasury reports Robert E. Wilson (Pan-American) George Moffett (Corn Products), and A. E. Marshall (Rumford) as managing directors of General Aniline. Robert E. McConnell, Engineers Defense Board, succeeds Mack as president.

OBITUARY:—Francis Irenee du Pont, 68, senior partner N. Y. Stock Exchange firm, Francis I. du Pont & Co., and well-known chemist, famous for work on smokeless powder and minerals separation process, died March 16.

LAST MINUTE NEWS AT PRESS TIME DIGESTED FOR C.I. READERS

CHEMICAL INDUSTRIES
CHEM-O-GRAM

WASHINGTON
PRICES
PRODUCTION
PERSONNEL

ALCOHOL:—The liquor industry's advisory committee to WPB proposes plan to relieve threatened sugar shortage by diverting low-proof whiskey alcohol to production of industrial alcohol for smokeless powder manufacture. About 100,000,000 gallons of alcohol averaging 140 proof is offered. Industry proposes that this be shipped to industrial alcohol plants where it could be run through fractionating columns and boosted to 190 proof, needed for smokeless powder.

MATERIALS SHORTAGES:—Conservation and Substitution Branch of Bureau of Industrial Conservation, WPB, issues first of periodic series of provisional reports on relative scarcity of certain materials. Materials are listed in three groups arranged according to general availability for substitution or use in civilian industry. Group I is made up of materials that generally are critically essential for prosecution of the war. For these civilian industry must largely find substitutes. Among the chemicals products listed are: methyl alcohol, chlorinated hydrocarbons, chlorine, diphenylamine, formaldehyde, paraformaldehyde, hexamethylenetetramine, phenols, polyvinyl chloride, sodium nitrate and toluene. Second group products are also necessary for war production but supply situation is not as tight. Essential civilian industry may obtain limited supplies in specific cases which are considered sufficiently important. Some products in this group are: acetone, anhydrous ammonia, barium carbonate, borax, carbon tetrachloride, camphor, casein, citric acid, cryolite, glycerine, iodine, mercury, natural resins, nylon, phosphorus, platinum, potassium perchlorate, potassium permanganate, quinine, reclaimed rubber, tetra ethyl lead, and vitamin "A" products. Third group includes materials that are more available for substitutions, although the supply is not unlimited and other considerations than the supply may determine availability. Some products in this group are: sulfur, lignin, salt, silver, aqueous ammonia, bismuth, cellophane, palladium, rosin, turpentine, cellulose acetate and butyrate plastics, soybeans and products thereof, and uranium.

S.O.C.M.A. ANNUAL MEETING:—The Synthetic Organic Chemical Manufacturers' Association is tentatively planning a two-day meeting at Skytop Lodge, Skytop, Pa., on Friday and Saturday, June 5 and 6. It is planned to open gathering with a luncheon on Friday followed by a business meeting. Saturday will be given over to golf. The Manufacturing Chemists' Association this year is not going to Skytop but will hold the 70th annual meeting at the Waldorf, Thursday, June 4. It is expected, however, that many of those attending the MCA meeting will go on to Skytop.

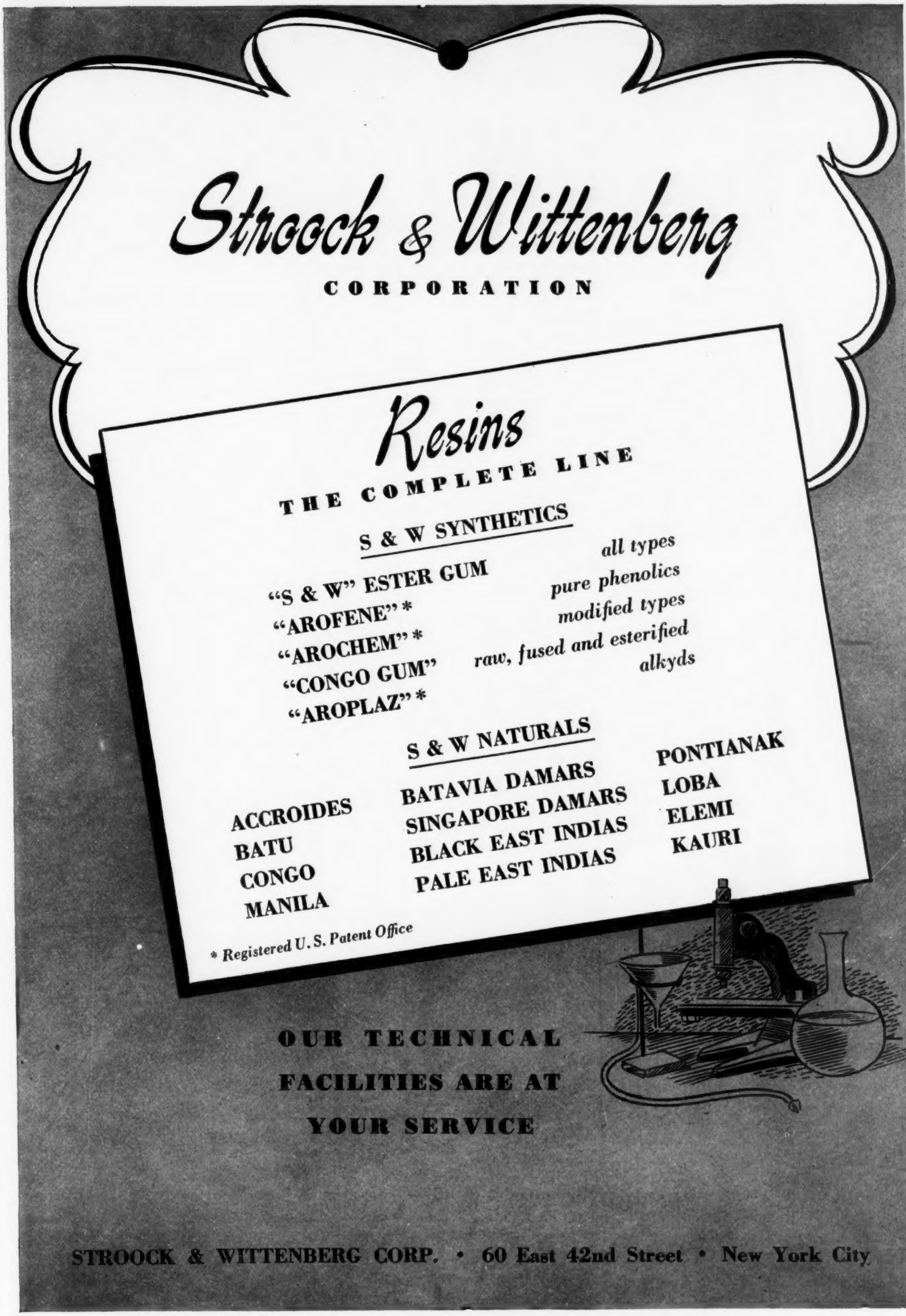
RUMOR FACTORY:—Story will not down that Thurman Arnold is about ready to blast away at the chemical industry or at least certain parts of it. Subpoenas are said to have been served on many company heads returnable in Newark, March 16.

CHEMURGY:—Eighth Annual Chemurgic Conference will be held at the Stevens in Chicago, March 25-27. Theme is "Chemurgy In War."

CHLORINE ORDER AMENDMENT: Delay in printing forms causes postponement of effective date of Amendment No. 1 to General Preference Order M-19 relating to chlorine to April 1. See Editorial this issue 322.

FREON CYLINDERS:—WPB is asking all freon users to return at once empty cylinders. Situation is critical.

DCAT BANQUET:—S. B. Penick, Jr., Chairman, Drug, Chemical and Allied Trades Section, N. Y. Board of Trade, reports Red Cross received $6,000 from dinner proceeds. Attendance record set with about 1,900 diners.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Now—Not 1943—Nelson

"IT is the greatest production job in history. And it must be done this year—the year 1942. We have but ten months to go—304 days—in which to strengthen our striking power to a point where victory can come within our grasp"—from Donald Nelson's radio address delivered Monday, March 2, first in a series of four to be given by our dynamic War Production Board head.

Fighting words from a man who is every inch a fighter. True words from a man who talks straight from the shoulder. Inspiring words from a man who in the greatest crisis this Nation has ever known is proving to be a great natural born leader. But he single-handed cannot beat back the Jap and German hordes battering at our very gates. That is your job and my job.

CHEMICAL INDUSTRIES

"The war," said Mr. Nelson, "can be lost in Washington. It cannot be won here. That can be done only on the battle lines that now extend around the world and on the production lines that extend across this nation. Those production lines will determine whether we hold the battle lines and whether ultimately we crush the enemy." What Mr. Nelson seeks is a 25 per cent. increase in production from existing equipment. Will he get it? That is your job and my job!

Certainly we cannot hope to do the job adhering strictly to a 40-hour work week. Certainly we cannot hope to do the job idling away precious hours striking against real or fanciful grievances. Most assuredly we cannot do the job unless capital, management and labor find ways and means of teaming together to assure the defeat of a common enemy. France went down with a sickening thud because those elements just would not settle their differences swiftly, justly and amicably. Our fate will be no different unless we heed that tragic lesson now.

Certainly we *can* do the job if we have full, three-shift operations, if we come very, very close to that goal of 168 hours of work per machine per week. Certainly we *can* do the job if we enter wholeheartedly into the "greatest competition of all time in which the wills and the skills of American industry—men and management—can really make freedom ring around the world."

It is, indeed, true that plant conversion in so far as the heavy chemical industry is concerned offers less opportunities than in the fields of fabrication. Yet, within certain limitations, a great deal can be accomplished. And much more can be accomplished in the chemical specialties field.

Machinery has now been set up by the War Production Board in the form of a Chemical Facilities Division under the direction of C. T. Thompson for exchange of information. If you have any idle equipment that you feel can be put to work producing war essentials, or if you want to know what products to produce we urge you to turn to The Reader Writes page (302). Mr. Thompson has outlined for you just what this new section can do to help you "defeat an enemy more ruthless, brutal and bloody than we ever faced before."

Walter J. Murphy

Editor, Chemical Industries

EDITORIAL

Chemical Export Pools: The suggestion that export pools be formed under government auspices to assure a flow of exports of vital chemicals to South America (reported in the New York Times) has caused more than a ripple of interest and no end of speculation as to just what "all the shootin' is about."

No specific recommendations are contained in the Times' article as to just who will constitute the pool or pools. It does state that—"In general, the plan would be for the WPB to require chemical materials producers to allot stated percentages of their production to the export pools, with these percentages to be determined in the light of the general policy of assisting Latin America."

There can be little quarrel with the broad premise that we must aid South American countries with sizable quantities and that there must not be any price gouging. It is quite possible and even likely that our representatives at the recent Rio de Janeiro Conference made certain specific commitments on supplies for Latin America including certain chemicals. But you just can't get "blood out of a stone" and domestic producers will be pretty much in this situation if they are made to meet increased South American demands. What with the requirements for strictly war purposes and for Lease-Lend any further tonnages for export of vital chemicals must come from still further rationing of supplies earmarked for domestic consumption in non-defense industries. At least we should be certain that what we do ship to our neighbors to the South is of vital importance and has some bearing on defense. To put it in another way, if severe rationing is necessary here then a similar policy is only just and equitable in the countries that admittedly now depend almost entirely upon us for chemicals.

Future events may or may not make it desirable to further regiment export business, by appointing a government director and for the formation of pools. The OPA to date seems to have done a fairly good job of "clipping the wings" of those who would run export prices to ridiculous speculative heights as compared with domestic contract prices. In most instances it appears to be amenable to requests for export licenses at levels higher than ceiling prices where sound justification for such action can be shown. It is also true that by the very nature of the present situation export prices as a general thing must of necessity be pitched somewhat higher than domestic consumer contract prices. South American importers recognize this condition. What they are most concerned with is getting material. When you start to legislate away the law of "supply and demand" you are bound to run into many difficulties. The wonder of it is that the situation on exports is not infinitely more serious than it is at the moment.

Chlorine Goes All-Out: Further curtailment in chlorine consumption in non-defense industries now appears necessary despite recent increases in productive capacity in many privately owned plants and completion of large government installations at several strategic points.

Amendment to Order M-19 announced as effective February 27 and later reported held temporarily in abeyance imposes drastic restrictions. It prohibits use of chlorine or products containing available chlorine in the bleaching of foodstuffs, bleaching of wiping rags and waste and the manufacture of cosmetics and toilet preparations. Such restriction will hardly impose any real hardship for chlorine in these fields simply improves appearance of the end products.

Curtailments are applied to the amount to be used in bleaching of textiles, in shellac processing, in laundry operations, in the manufacture of home bleaching preparations, and in the sanitation of private swimming pools.

One of the newspapers puts it quite tritely when it reports "White dinner shirts, snowy bed linens may soon be things of the past." Use of chlorine in textile bleaching, according to the order of February 27, is to be sliced in half and shellac bleaching approximately 25 per cent. All laundry operations must do without chlorine, with the exception of 10 per cent of former usage for stain conditions. This just about sounds the death knell of the industrial "bleach" producer. Specialty manufacturers who have built up excellent volume in the field of sodium hypochlorite solutions in small containers for household use are also badly hit. They must reduce their use of chlorine by 40 per cent. Thus "cola" drinks will not be the only scarce item at the corner grocery store.

For the moment no change is contemplated in the regulations imposed on pulp and paper manufacturers, but it is highly significant that the WPB reports that war demands are increasing and still further restrictions on this vital chemical may yet be necessary. Along these lines comes a warning from the Chemicals Branch that the situation in chlorinated solvents will get worse instead of better and search for substitutes by metals fabricators is in order.

Who would have suspected two years ago that chlorine would occupy the position it now does? It seems that once upon a time . . . .

Tin Supplies: So much attention has been focused on rubber that tin has been forced into the background. Yet both commodities offer serious difficulties. While little is known of what our tin stockpile actually totals, there is good reason to believe there is enough to last about 15 months, without taking into consideration imports which may or may not yet be arriving. We also still have Bolivian ore to draw on. There is every reason to husband most carefully what we have. Get the habit of saving tubes and cans if you are in a locality where collections are possible.

The Professional Issue: The recent decision of the National Labor Relations Board in the matter of the Shell Development Company and the International Federation of Architects, Engineers, Chemists, and Technicians, Case No. R-3245, establishing the principle that professional employees should not be forced into a bargaining unit composed of a miscellaneous group of skilled and unskilled workers as well as professional employees is indeed a great victory.

Congratulations are in order to all those who have contributed in many ways to this momentous achievement. But a word of caution is not at this particular moment entirely out of order. Chemists must continue

(Continued on Page 395)

The past 20 years, although only a moment in the life of the alkali industry, have been marked by considerable progress in the alkali field. We have all benefitted by these changes. This story points out how, what and why, in a practical way

TWENTY YEARS' PROGRESS *In Alkali Technology*

By David Aronson, **associated with Z. G. Deutsch, Consulting Chem. and Mech. Engineer**

MAN'S utilization of alkali is almost as ancient as his use of fire. For centuries, the collecting and leaching of ashes for their lye had been practiced by unknown and unsung du Ponts, Queenys, and Dows. Led by the desire to overcome the bottlenecks inherent in this crude method of production, LeBlanc, towards the close of the eighteenth century, worked out his history making process for the manufacture of soda ash. When sixty years ago the first plant in America began to turn out soda ash by Solvay's ammonia-soda process, this improved method had already been in successful operation in Europe for a number of years and was rapidly gaining ascendancy over the older LeBlanc process. Thus the twenty years, from 1921 to 1941, which we will consider, are seen to be only a recent moment in the life of this grandfather of chemical industry.

Despite the relatively short time, these twenty years have been marked by considerable progress in the alkali field. If the advances do not seem as striking as those in the realm of plastics or synthetics, the reason may be that we cannot thrill to the appearance of an improved alkali as we do to the sight of a new textile fiber or a new plastic. The changes in alkali during the past two decades are not those of outward appearance, and although we cannot see the improvements, nevertheless we have all benefitted by them. Almost every moment of our daily lives we are using articles which are the better for the progress made by the alkali industry. If we really want to know how we have been affected by these advances, we need only ask the purchaser of alkali (and that means almost every one of the many chemical and process industries in the country). In answer, the alkali user would not hesitate a moment to tell us how the higher purity of alkali has enabled him to improve the quality of his product, and how at the same time he has been able to reduce his costs because the large quantities of alkali required in his operations are delivered by better means of transportation, with more regularity, and at much lower prices.

A better idea of the importance of the alkali industry in our national economy can be gained from the figures on its annual production. Serving directly or indirectly in the production of almost every other chemical, the alkali manufacturers' three principal products, soda ash, caustic soda, and chlorine are turned out in quantities that literally stagger the imagination in 1939, the last "peace-time" year, the grand total being approximately four and a half million tons. Obviously the present rates of production are considerably higher.

The large quantity of alkali consumed and the infinite diversity of uses combine to make the fundamental economics regulating this industry almost exemplary. The manufacturing plants must be so located with respect to the consuming industries that the combination of costs of raw material, of manufacturing, and of transportation delivers the cheapest pure product to the doorstep of the consumer. For today's alkali maker the essentials are a large cheap supply of raw materials (lime, salt and fuel for the ammonia-soda process; brine and electric power for the electrolytic process), a growing volume of sales close to maximum plant capacity, and facilities for deliveries by waterway, railway, and highway.

In order to understand more fully the unique nature of some of the developments in this industry, we must have some knowledge of the part played by chemistry in the economics of the two main processes—the ammonia-soda and the electrolytic. In the electrolytic method about equal quantities of caustic soda and chlorine are produced from the sodium chloride brine which serves as the raw material. If the producer has a larger sale of chlorine than caustic, the latter accumulates as a surplus, and conversely a larger sale of caustic results in a surplus of chlorine. For successful operation of a market of approximately equal size must be found for the two products. (Because of the simultaneous production of chlorine and caustic in the electrolytic cell we have come to think of chlorine as belonging in the alkali field, although it really is not an alkali in the technical sense.)

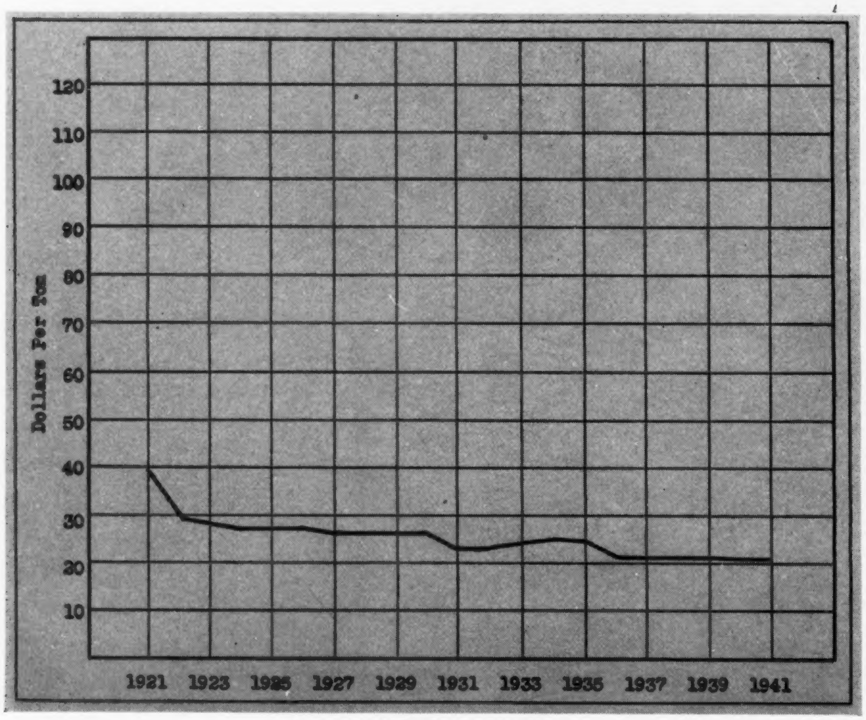
The ammonia soda manufacturer who obtains caustic soda by causticizing soda ash with lime, is able within limits to alter the relative quantity of his two main products, soda ash and caustic soda, but of course, he always aims at maximum total production.

Partly as a result of the limitation of the electrolytic method compelling equal production of chlorine and caustic, a bitter and costly price war was waged between the large alkali manufacturers and the consumer-producers in the paper and textile industry. After the first World War many of these paper and textile manufacturers had available electric power which they decided to use for the production of chlorine required in their processes. Small electrolytic plants were engineered and erected for these manufacturers by holders of patents on cell designs. The consumers who operated these plants had as a byproduct caustic which they did not

Filling drums with caustic potash flake. Niagara Alkali Co.

require and which they could offer cheaply in the local market. This competition necessarily cut into the local sale of caustic by the ammonia soda manufacturers. To combat this threat the Solvay Process Company in 1927 built the huge electrolytic plant at Syracuse, New York to produce chlorine and caustic from soda-ash subsidized power, and offered the product at low prices. Other alkali manufacturers were in the same position as Solvay in that they had a demand for considerable quantities of process steam to make fuel-free new electric power available by the installation of high-pressure steam-generating equipment. This position is so favorable that as of the end of 1942 only two plants, Mathieson's at Saltville and Solvay's at Detroit, of the nine existing ammonia-soda plants, will not be producing chlorine. The keen competition in this market has resulted in the published price for chlorine falling from $110 per ton in 1921 to $35 per ton in 1941. This price reduction in turn has developed new markets for chlorine. We can therefore consider that both the industry and the consumer gained ultimately from this keen competition.

Aside from this forced growth, the al-



Trend of Soda Ash Prices

kali industry expanded along with the rest of the chemical industry which was growing at a pace outstripping that of industry as a whole. Although the memorable depression of the early 30's brought curtailment of production, the magnitude of this curtailment was much less than, for example, in the steel industry.

What particular new markets in the expanding chemical and process industries developed for alkalies during this twenty-year period? The one which probably had the greatest effect on the alkali industry was the rayon market for caustic soda. This was increasing at a rate sufficient to absorb much of the surplus caustic soda being produced in the new electrolytic installations. The situation, however, was not at first a happy one. New and difficult problems had to be solved. The requirements of their process led the rayon manufacturers to seek and demand purer caustic soda than that produced by the lime-soda process or by the electrolytic process using the diaphragm type cell. Only the mercury-type electrolytic cell, of which there was but a single important installation, that of Mathieson Alkali Works at Niagara Falls, could produce a high-purity caustic.

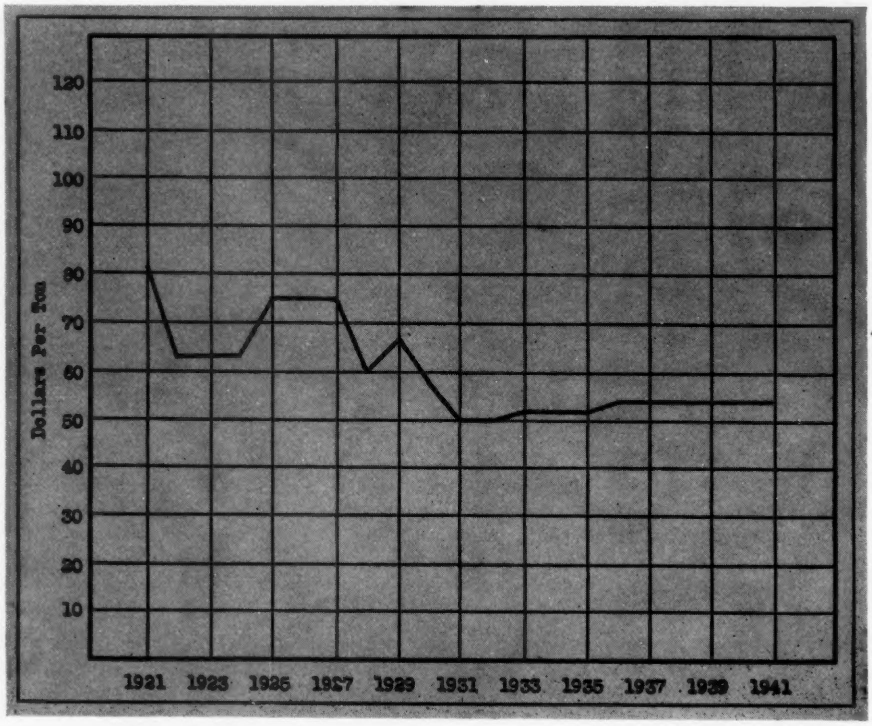
In order to reduce their surplus caustic stocks the other manufacturers had to bring the quality of their product up to the specifications of the rayon industry. In the case of the electrolytic operators this was in large measure accomplished by borrowing from the rayon manufacturers the technique of dialysis which the latter had developed for eliminating hemi-cellulose from their caustic solutions. High sodium chloride content had been the principal complaint against the product of the diaphragm type cell. In this cell the caustic is formed as a weak solution in a sodium chloride brine and is separated from the brine by an evaporation process during which most, but not all, of the salt crystallizes out. Dialysis made it possible to remove practically all of the salt that remained with the caustic after evaporation.

The lime-soda operators kept pace with the demand for improved purity by developing methods of chemical treatment and "polishing" to reduce the concentration of alumina, silica, and sulfate present as impurities in their product.

The partiality shown by rayon manufacturers to caustic from the mercury-type electrolytic cell prompted the Michigan Alkali Works in the late 1930's to install Krebs cells of this type at their Wyandotte plant. Several Krebs installations had been operating in Europe but this was and probably will remain for some time the only one of its kind in America.

Another new customer for alkali and the largest single one during this period was the synthetic nitrogen industry, born in this country during the last World War. The availability of a large source of synthetic nitrogen indicated the possibility of supplying the Southern fertilizer market with a domestic product in place of the sodium nitrate imported from Chile. In order to avoid the problem of educating the farmer to a different type of nitrate fertilizer, it was decided to convert the synthetic nitrogen into sodium nitrate. To manufacture this chemical by the reaction between soda ash and synthetic nitric acid, Allied Chemical and Dye Corporation erected a large plant at Hopewell, Virginia, which when completed in 1930 obtained all its soda ash from Syracuse, New York. Coming from a location not on tidewater, this soda ash had to be sent by barge in summer or rail in winter to New York City and then transferred to ocean-going vessels for delivery to Hopewell on the James River. Location on tidewater and favorable conditions for the manufacture of soda ash in the Gulf Coast region determined the selection of Baton Rouge as the site for a new alkali plant to supply part of the requirements of the Hopewell synthetic sodium nitrate opera-

Trend of Caustic Soda Prices

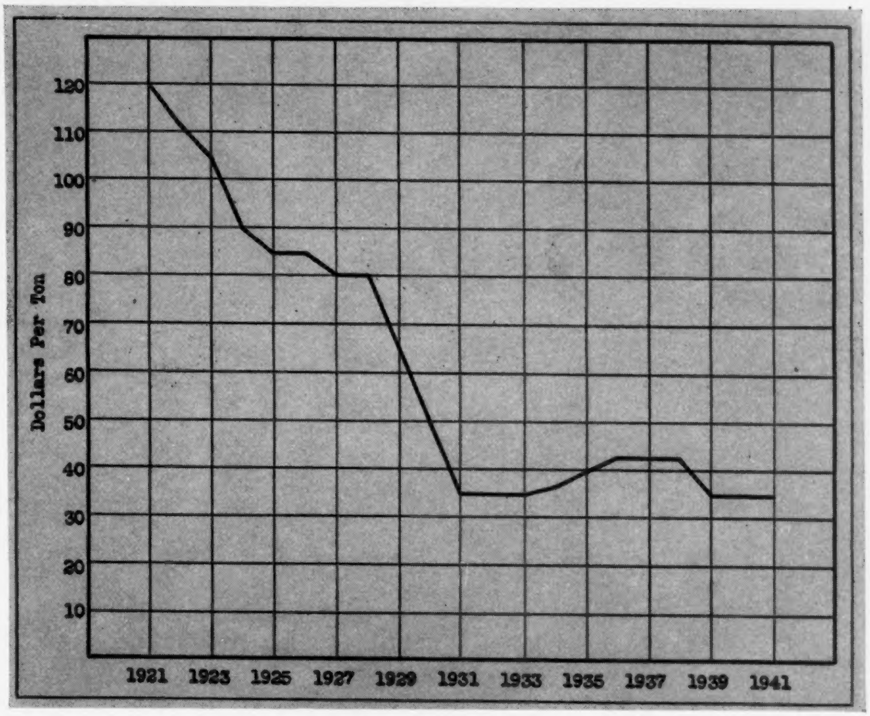


tions. This new plant was completed in 1935 with a designed capacity of 500 tons of soda ash per day.

It was the third of three alkali plants erected in Southern territory in the 1930's, which started the Southern ammonia-soda industry. From 1884 when Solvay Process Co. erected the first plant in this country, until the 1930's, all the plants were concentrated along the Great Lakes region, with the exception of Mathieson's operation at Saltville, Virginia. The new trend of industry to develop near the source of its raw materials resulted in the movement of the viscose industry towards the South, the principal supply of wood pulp and cotton linters, and the movement of petroleum refining southward and westward, closer to the wells of Oklahoma and Texas. This movement of the alkali markets favored the development of a source of alkali in the South. Surveys of possible locations for new plants showed the Gulf coast to have a fortunate conjunction of salt, lime (from oyster shell), and cheap fuel. Tidewater transportation brought the industry right to the coast—Solvay, as already mentioned, building at Baton Rouge, Mathieson establishing their plant at Lake Charles, Louisiana and Southern Alkali entering the ammonia-soda field with works at Corpus Christi, Texas. These plants have incorporated in their design all the improvements worked out by long experience at the older installations, and are considered examples of efficient performance.

The development of petroleum refining in the South created a demand for sodium metal, which was met by the construction at Baton Rouge of a plant for electrolizing fused sodium chloride to produce both the required sodium and chlorine gas. The only previous installation of this type was that of the R. and H. Division of du Pont at Niagara Falls. Sodium metal is used in the manufacture of ethyl fluid. High-power airplane engines have been made possible by the use of sodium metal which fills every valve on engines of 300 horsepower and over, and serves to cool the valve. Investigation would probably reveal many more unique applications of this and other products of the alkali and chlorine manufacturers.

The Western section also took advantage of its natural resources to enter the alkali field. Cheap hydro-electric power in the Pacific Northwest favored the erection of electrolytic installations. Two were put up at Tacoma, Washington, and one at Pittsburgh, California. The output of these plants added to that from natural sources is usually adequate for the local market. Compared to the production of the country as a whole the output from natural sources is small; at most operations, the soda ash is incidental to production of other salts. Yet despite their smaller production, plants such as that at Searles Lake command our attention as splendid examples of the application of the theories of physical chemistry to the development of a new and profitable industry. By studying phase-rule diagrams showing the solubilities of complex mixtures of salts the chemical engineers were able to work out methods of extracting, separating and purifying the several constituents at a reasonable cost.



Trend of Chlorine Prices

With regard to the entire alkali industry, mention has already been made of forward steps in technology required to make possible the reduction in price and the improved purity of product. Ammonia-soda production advanced from an art to a technology, applying the principles of chemical engineering to its many operations. From its beginning over seventy years ago until quite recently, the ammonia-soda industry had as its gravest problem the reduction in ammonia loss. Now that this problem has been well-nigh solved, it is no longer critical since the price of ammonia has fallen markedly as a result of new synthetic methods of manufacture.

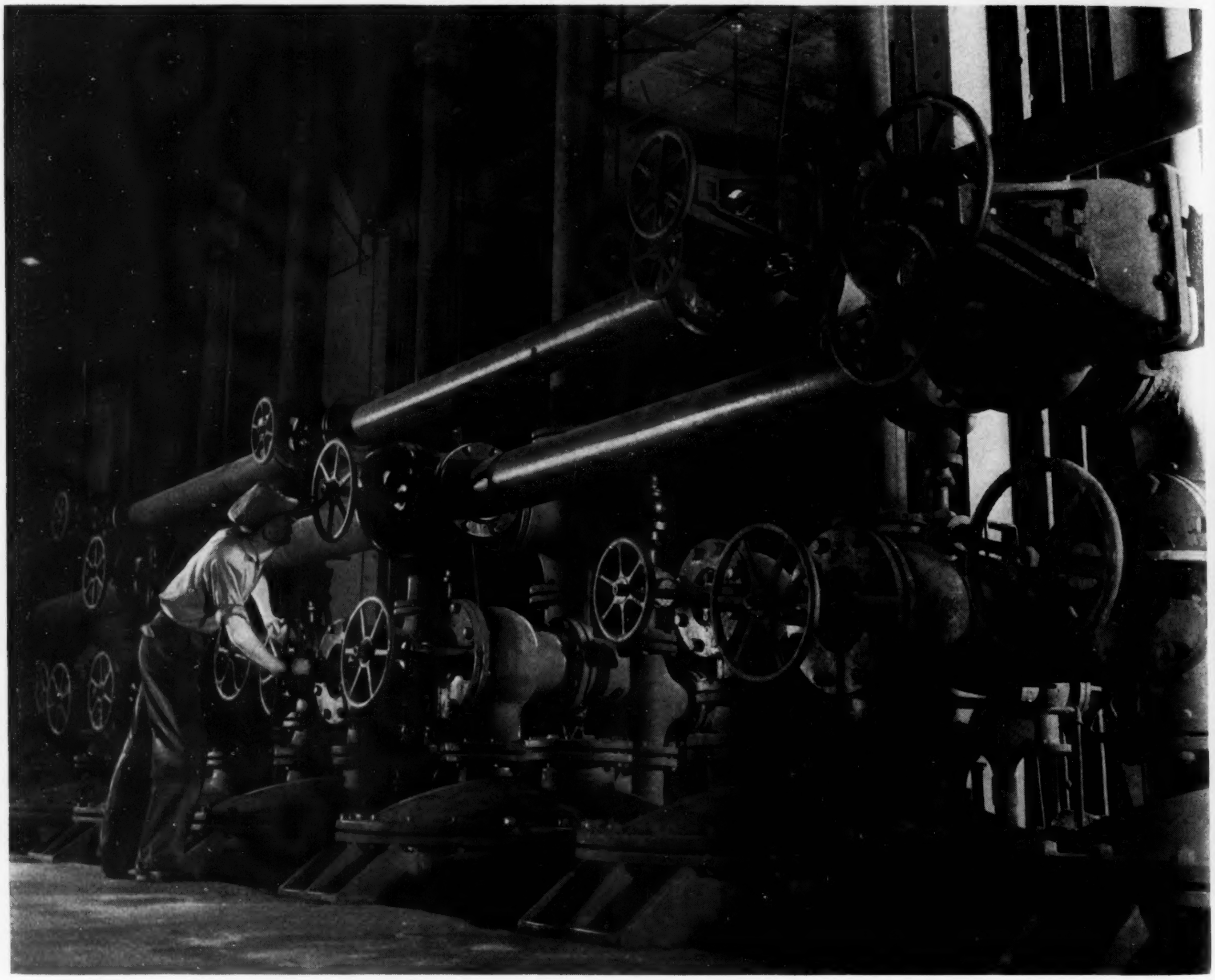
Also to be classed as an art was the lime-burning operation which was based on the accumulated experience of past decades. It, too, was improved considerably during this twenty-year period by careful engineering. The burning of lime is an important operation in the ammonia-soda process which uses both the CO_2 gas and the CaO content of the lime. For lowest cost product, the carbon dioxide gas is desired at a high concentration. The improvements effected in lime burning were higher capacity per unit, lower maintenance cost, higher gas concentration. In connection with the industry on the Gulf Coast, utilization of oyster shell as a source of lime posed a difficult technical problem due to the physical form of the material, which crumbles under its own weight in standard vertical kilns. Rotary kilns were successfully adapted and developed to the requirements of this material. Attempts made to use vertical kilns for

United States Chlorine Statistics*

Year	No. of Establishments	Total Production Tons†	Made & Consumed in same Establishment Tons†	Made for Sale		
				No. of Establishments	Tons	Value
1921	13	37,985	9,374	....	28,611	3,188,750
1923	12	62,681	24,622	....	38,059	2,778,088
1925	14	83,163	30,683	....	52,480	4,236,307
1927	15	117,489	27,408	....	90,081	6,678,145
1929	20	199,472	54,545	....	144,927	7,113,091
1931	20	180,870	53,115	....	127,755	5,248,496
1933	20	217,089	92,526	16	124,563	4,486,325
1935	22	315,139	107,759	19	207,380	7,961,186
1937	25	446,261	160,301	22	285,960	10,416,672
1939	32	490,256	175,126	22	315,130	10,468,337

* Biennial Census of Manufacturers.

† Not including chlorine made and consumed by establishments classified in the Pulp industry.



Lines to carbonating tower from gas engine scrubbers, Michigan Alkali Works.

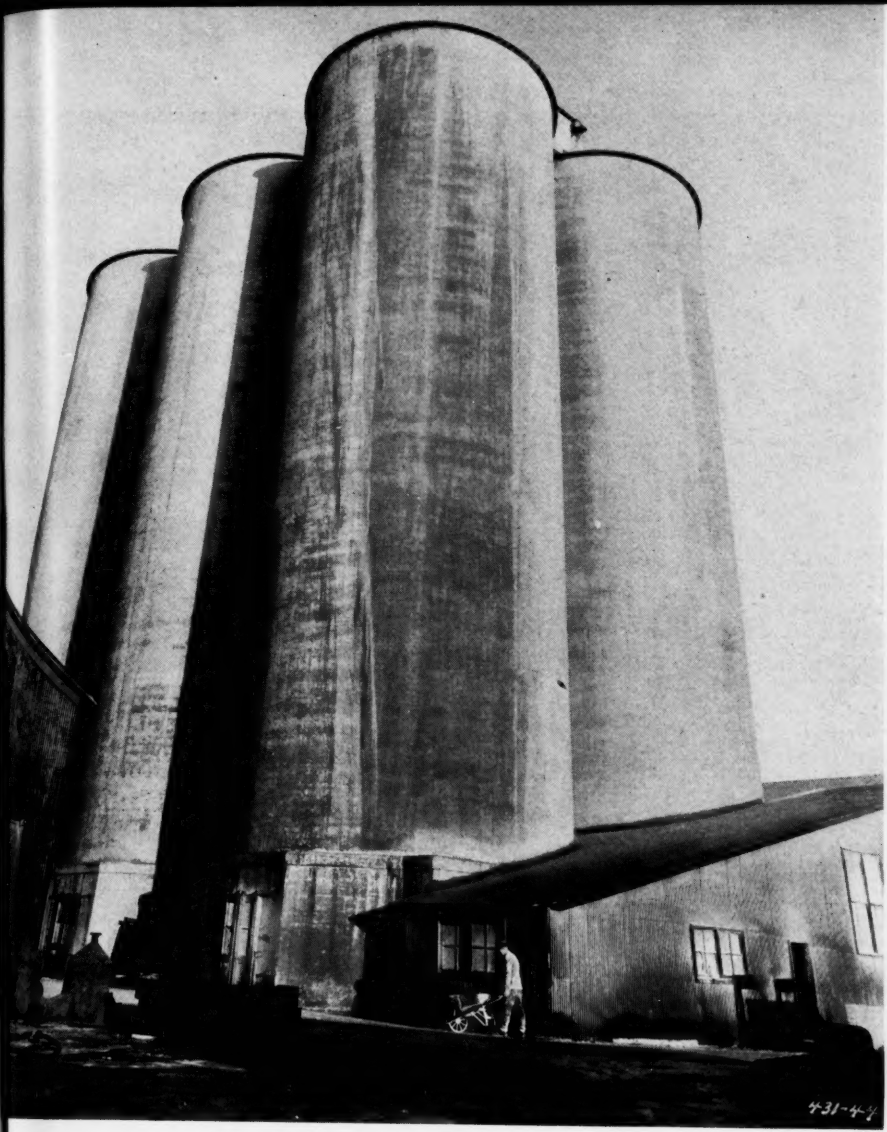
mixed feed of stone and oyster shell did not give such favorable results.

To the layman the most striking change in the ammonia-soda industry has been the substitution of small, high-speed centrifugal compressors for slow moving reciprocating compressors occupying about five times the floor space. The Biblical story of David and Goliath is an ideal analogy, (except that reciprocating compressors will still be in operation for quite a while) for the centrifugal compressors make use of the very same physical principle that David used to give so much power to his shot from a sling, that is the high force developed by centrifugal action on a rotating body. At least four of the nine ammonia-soda plants have installed these compressors for delivering a part of carbon dioxide gas to carbonators, and in one of the new Southern plants the entire production is dependent upon the successful operation of centrifugal compressors. This type machine required painstaking development of rotors of high-strength corrosion-resistant metals and a better solution of an old, old problem of the in-

United States Caustic Soda Statistics*

						ELECTROLYTIC					LIME-SODA				
Year	Total No. Establishments	Total Production Tons	Made & Consumed in same Establishments Tons	Made for Sale Tons	Made for Sale Value	No. of Establishments	Total Production Tons	Made & Consumed in same Establishments Tons	Made for Sale Tons	Made for Sale Value	No. of Establishments	Total Production Tons	Made & Consumed in same Establishments Tons	Made for Sale Tons	Made for Sale Value
1921	35	238.591	7.695	230,896	16,628,400	..	......	......	75,547	......	..	......	......	163,044	......
1923	23	436,619	5,658	430,961	25,056,547	17	......	......	122,424	......	6	......	......	314,195	......
1925	22	497,261	10,116	487,145	27,392,352	16	......	......	141,478	......	6	......	......	355,783	......
1927	30	573,417	26,112	547,305	29,193,003	17	......	......	186,182	......	6	......	......	387,235	......
1929	..	761,792	37,118	724,674	36,089,264	20	......	......	236,807	......	6	......	......	524,985	......
1931	..	658,889	24,676	634,213	26,565,202	22	......	......	203,057	......	8	......	......	455,832	......
1933	27	686,983	42,252	644,731	24,478,385	21	247,620	39,114	208,506	8,683,911	9	439,363	3,138	436,225	15,794.474
1935	30	759,381	39,171	720.210	28,134,175	22	322,401	34,881	287,520	11,263,248	11	436,980	4,290	432,690	16.870,927
1937	30	968,726	71,315	897,411	32,027,796	24	479,919	64,442	415,477	14,137,170	11	488,807	6,873	481,934	17,890,626
1939	30	1,025,011	74,854	950,157	34,541,479	25	......	......	426,250	15,094,950	10	......	......	523,907	19,446,529

* Biennial Census of Manufacturers; tons are short tons.



Soda ash storage, Diamond Alkali Co.

dustry—the thorough cleaning of the kiln gases.

The fortunate position of the ammonia-soda-industry, which enables it to resort to higher steam pressures in order to "cream off" additional electric power required in modern labor saving equipment and in the production of power used in the electrolytic processes, made it the logical leader in the application of higher steam pressures: the very first high-pressure industrial power plant was at Solvay's operations in Syracuse, and today's highest pressure plant operating at 2,200 pounds per square inch is installed at Fairport, Ohio.

During these twenty years America's capacity for manufacture of ammonia-soda was increased about fifty per cent. The growth in part came from the new plants of the South, but mainly from increased capacity built at existing plants. Installation of advanced design units of very high capacity generally effected this increase. A single ammonia still could do what three or four formerly did. Single continuous filters to replace and even increase the capacity of several older filters were common examples of this trend of substituting one large unit for several smaller ones of lower efficiency. Decreased investment per unit as well as more efficient labor utilization resulted from these improvements.

By developing a method of converting sodium bicarbonate to carbonate in steam heated equipment instead of in the venerable but reasonably well perfected externally fired rotary shell calciners, one of the Southern plants carried through the new trend. The improvement effected in overall economy resulted from the increase in the total quantity of fuel burned in the high pressure boiler where it can be accomplished with high efficiency, and the reduction in the quantity burned in comparatively inefficient auxiliary apparatus. This method of conversion from bicarbonate to carbonate also promises markedly lower maintenance cost per ton of product.

In the electrolytic branch of the alkali industry progress parallelled that in the ammonia-soda field. The credit for pioneering in the realm of higher steam pressures belongs to both divisions of the alkali industry.

At some of the large size electrolytic plants advantage was taken of the higher efficiency of mercury arc and ignitron rectification compared to that of rotary converters and motor generator sets. Only at plants where sufficient cells can be connected in series to take voltages of at least 500 to 600 are these new static methods of rectification efficiently applicable. These rectifiers with their relative insensitivity to atmospheric corrosion are particularly valuable in electrolytic operations.

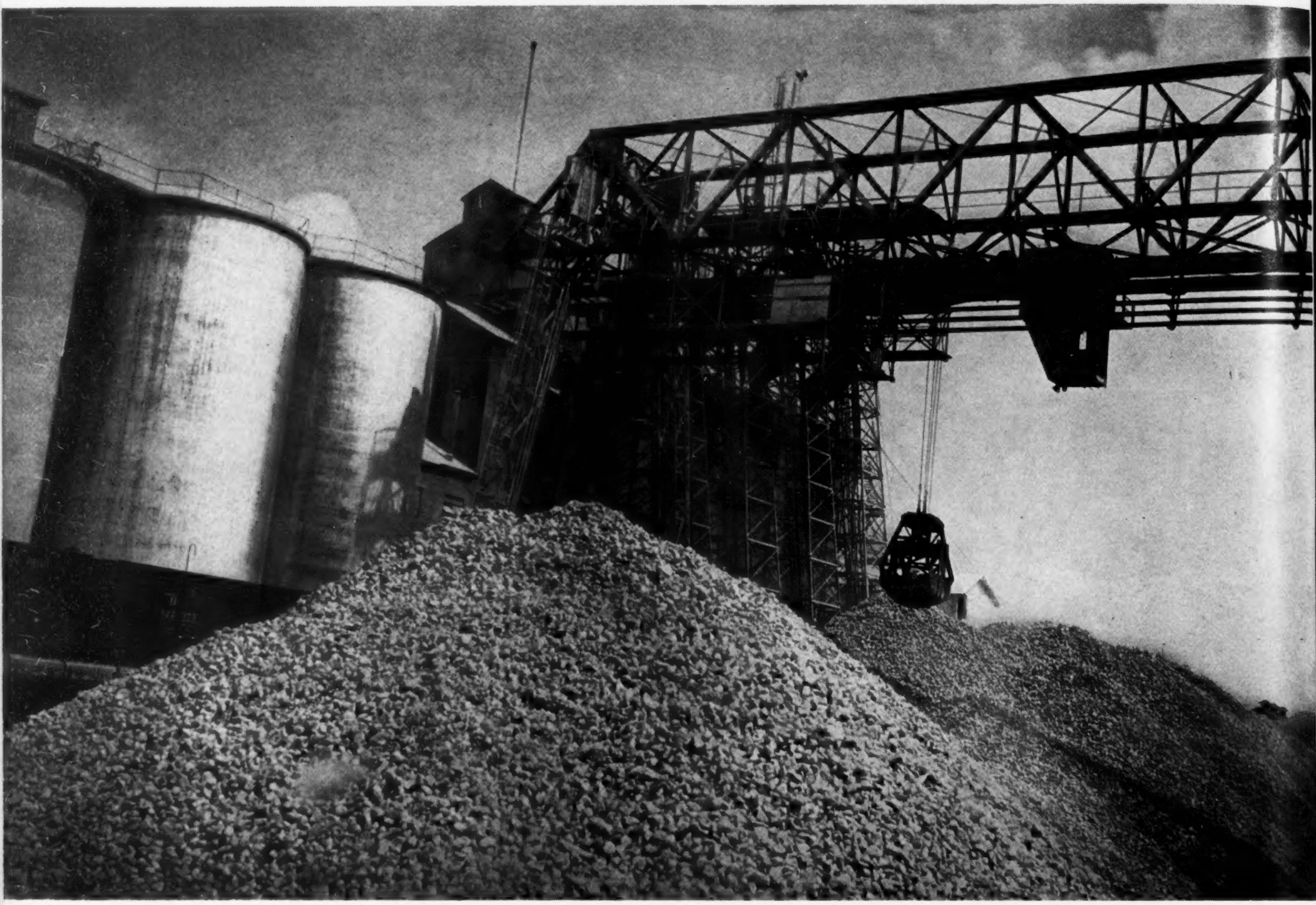
The considerable improvement in the technique of handling gases has placed the electrolytic operator in a much more favorable position today than twenty years ago. The troublesome problem of handling chlorine was a factor in deciding paper and textile mills to manufacture their own gas. The degumming purification of chorine, another accomplishment of the past decade, makes the operation of delicate gas-feeding equipment much more reliable.

The better gas-handling techniques have increased the number of applications for

United States Soda Ash Statistics*

				Made for Sale		AMMONIA-SODA			For Sale		NATURAL & ELECTROLYTIC SODA		
Year	No. of Establishments	Total Production Tons	Made & Consumed in same Establishments Tons	Total Tons	Total Value	No. of Establishments	Tons	Made & Consumed in same Establishments Tons	Tons	Value	No. of Establishments	Tons	Value
1921	19	959,593	183,265	776,328	29,347,426	8	929,448	183,265	746,183	28,316,435	11	30,145	1,030,991
1923	14	1,707,987	449,207	1,258,780	32,427,166	6	1,674,234	449,207	1,225,027	31,413,210	8	33,753	1,013,956
1925	12	1,907,791	539,131	1,368,660	32,243,941	6	1,850,013	539,131	1,310,882	30,914,558	6	57,778	1,329,383
1927	12	2,037,808	571,429	1,466,379	29,939,291	6	1,974,157	571,429	1,402,728	28,645,404	6	63,651	1,293,887
1929	14	2,682,216	868,360	1,813,856	34,648,657	6	2,586,304	868,360	1,717,944	32,540,942	8	95,912	2,107,715
1931	15	2,275,416	766,737	1,508,679	22,492,943	7	2,189,351	766,737	1,422,614	21,079,187	8	86,065	1,413,756
1933	11	2,317,011	662,983	1,654,028	24,182,681	6	......	......	1,585,633	23,163,690	3	68,395	1,018,991
1935	16	2,508,859	637,224	1,871,635	28,424,750	9	......	......	1,776,470	27,212,035	7	95,165	1,212,715
1937	17	3,037,421	713,662	2,323,759	33,768,770	9	......	......	2,205,006	32,306,416	7	118,753	1,462,354
1939	16	2,960,722	815,021	2,145,701	32,862,016	9	......	......	2,012,804	31,106,153	6	132,897	1,755,863

* Biennial Census of Manufacturers; tons are short tons.



Limestone storage at Pittsburgh Plate Glass Co.. (Columbia Alkali Division).

United States Modified Sodas Statistics*

Year	No. of Establishments	Tons	Value
1921	....	......	......
1923	12	47,669	1,342,182
1925	5	47,452	1,550,772
1927	....	......	......
1929	....	59,154	......
1931	....	......	......
1933	7	21,873	775,805
1935	9	29,103	1,140,022
1937	10	26,497	1,050,953
1939	9	32,101	1,265,288

* Biennial Census of Manufacturers.

hydrogen. Whereas formerly much of the hydrogen produced in electrolytic cells was discharged to the atmosphere, its extended use in synthetic ammonia manufacture, hydrogenation of oils, manufacture of hydrochloric acid where this conversion is economically justified, and many similar applications, have made hydrogen a valuable byproduct.

The alkali manufacturers, as has been pointed out earlier in this article, have consistently been improving the purity of their caustic. To safeguard this purity after manufacture, both branches of the industry developed the practice of shipping a large proportion of caustic as the 50% solution instead of the solid anhydrous material. The preparation of the anhydrous involved the handling of molten 76% caustic which, being a close approach to the "universal solvent" long sought by the alchemists, is contaminated by practically any and every type of container that could be used.

Reduction in iron contamination of caustic has been accomplished by the use of nickel equipment for evaporators, pipe lines, heat interchangers, storage tanks, etc. A few nickel-lined tank cars are in experimental use for the shipment of liquid caustic.

As an additional service to their customers several alkali manufacturers put in service insulated tank cars for the transportation of caustic solutions. This method of shipping eliminates the necessity of steaming out of caustic during cold weather, and of course, saves total time required to get caustic into the process. These insulated cars are 10,000 gallon units, in some instances without steam coils.

What can we say of the future of an industry that has made such vast strides during past decades? To some extent it can be delineated by observing the current developments and the changes being brought about by the present war efforts.

The development at Hopewell, Virginia, of a process for manufacturing sodium nitrate and chlorine gas from sodium

United States Sodium Bicarbonate† Statistics*

Year	No. of Establishments	Tons (Basis 100%)	Value
1921	6	129,331	2,635,022
1923	7	188,717	3,738,129
1925	6	146,854	3,651,848
1927	6	121,449	3,647,446
1929	5	140,234	4,062,074
1931	5	127,981	3,730,716
1933	5	129,273	3,585,862
1935	4	136,556	3,658,321
1937	5	142,161	3,606,271
1939	6	148,610	3,839,018

† Refined.

* Biennial Census of Manufacturers, tons are short tons.

chloride and nitric acid is the first that comes to mind. Principally because of corrosion difficulties this operation has developed slowly. The powerful incentive to further work on this process is the ideal combination of a cheap raw material, salt, substituted for the more expensive soda ash in the manufacture of the fertilizer, the desired product of these operations, and the obtaining of chlorine as a valuable byproduct. The most direct solution of the problem appears to be cheaper corrosion-resistant equipment, but as long as the war effort continues this will probably remain in the "expensive" range and thus hinder expansion of the process.

Only within the last few months another interesting process has been proposed by which chlorine and synthetic salt cake would be produced from salt and sulfur. Prof. Arthur Hixson has devoted considerable effort to working out this process which he says is under further intensive study. If successful this method would be of particular advantage to the paper industry now faced with curtailment of both chlorine and salt cake required in its operations. The salt cake, formerly imported to a large extent, is now available only from domestic sources, and the chlorine is given priority in its many defense applications.

The alkali industry may become an important factor in the rapidly expanding magnesium metal manufacturing field. The Defense Plant Corporation has under construction several metallic magnesium plants, one of which is to be operated by Diamond Alkali at Fairport, Ohio, and another by Mathieson at Lake Charles.

The supply of chlorine may be augmented significantly in the near future by the new magnesium metal industry at installations such as that being erected at Lake Charles, Louisiana, in conjunction with the ammonia-soda operations of the Mathieson Alkali Works. Here the magnesium chloride will be formed by the reaction of a dolomitic lime with the calcium chloride byproduct of ammonia-soda manufacture. In the electrolytic cell, magnesium chloride will be broken down into metallic magnesium and chlorine gas.

Eventually the additional supply of chlorine from these potential sources may exceed the demand if there is not an expanding market similar to that experienced in the past twenty years. The production of caustic soda by electrolysis of brine may then be curtailed.

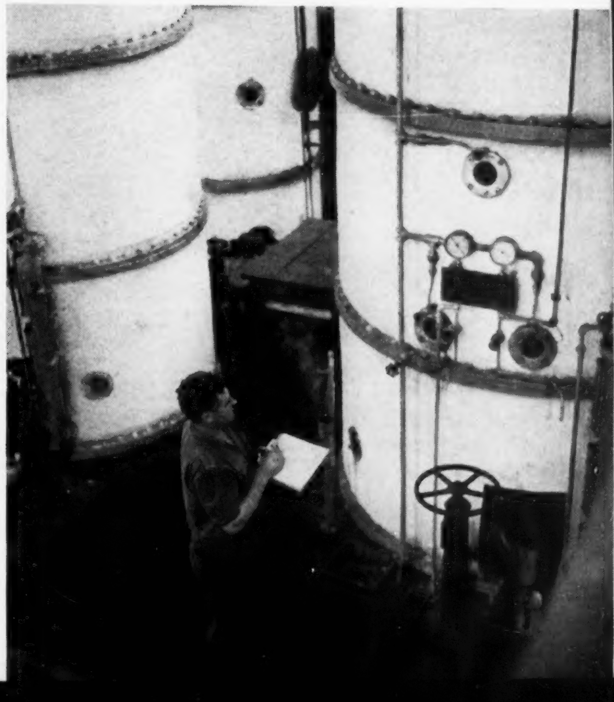
Other alkalies may grow in importance. Ammonia looks quite promising. Its use in munitions is resulting in construction of facilities for its production at a tremendous rate. Phenomenally low costs—expected to reach less than 1 cent a pound—will serve as a stimulus to develop methods of substituting this cheap alkali wherever its volatile character is not a drawback.

On the other hand, new quantities of electric power available at the end of the present war may promote the further expansion of electrolytic caustic. The possible market for chlorine will then be the deciding factor as between electrolytic caustic and lime-soda caustic. Improved gas technology is expected by many to expand the market for chlorine.

With the development of the West as an industrial center, the sources of natural alkali will no doubt be exploited still further. The production of natural soda from Trona as well as the separation of other salts has been discussed in an article on Wyoming's resources based on a report of Robert D. Pike (Chem. and Met. 48, 9, 112).

These predictions should of course not be considered as more than idle speculation. We are now engaged in an intensive struggle in which technology must advance at a pace never before imagined possible. The impact of these changes on our chemical industries will in all probability be so great as to make the older methods no longer recognizable.

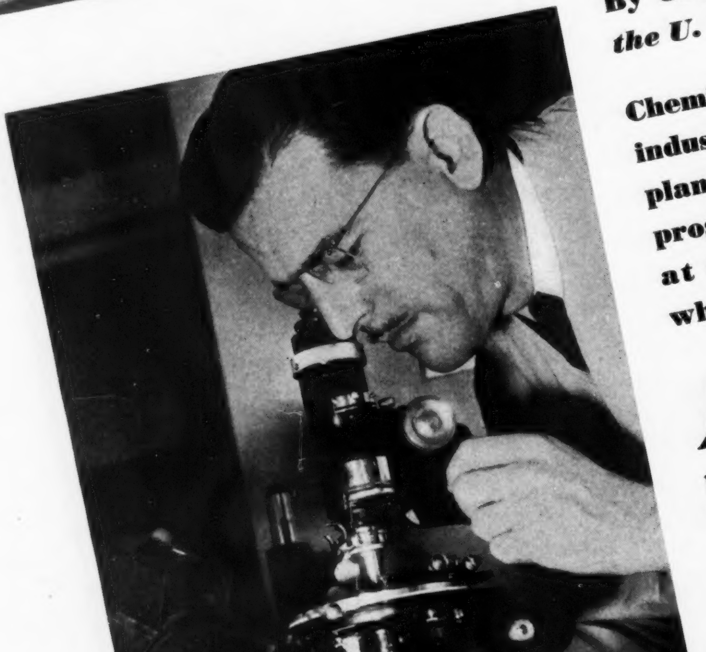
Below, Solvay plant. Top photo right, Penn Salt service engineer from Washington plant instructing workmen in handling of chlorine equipment. Center photo, interior shot of Isco plant, (Innis, Speiden & Co.). Bottom right, caustic soda evaporators, Monsanto Chemical Co.



U. S. Guards Against Sabotage

By John Edgar Hoover, *Director of the U. S. Bureau of Investigation*

Chemistry is a priceless ingredient of industrial production. Our chemical plants hold a vital place in our war program, and must be safe-guarded at all costs. Here is an inkling of what the FBI is doing and doing well.



AMERICA'S war program is rolling into high gear on a scale the magnitude of which no nation or combination of nations has ever equaled. The vast industrial facilities of the United States, guided by the peerless engineering genius, are rapidly girding our nation for the hard-earned victories to come.

Along with the Army and Navy, law enforcement agencies are first to meet the battle challenge. Equally important are the services of the millions of agricultural and industrial workers throughout the

Left, laboratory technician using petrographi microscope for soil and dirt examination, FB laboratory. Top right, J. Edgar Hoover. Top le a typical factory view showing fence and guar

Special agents of the FBI, U.S. Department of Justice, firing Thompson machine guns on range at Camp Ritchie, Maryland. Watch out saboteurs!

nation. Our major industries and transportation and communication systems must function smoothly. Nothing must halt even for an hour the flow of finished products along the national assembly belt.

It has been estimated that to keep one soldier adequately supplied on the battle front, it takes the combined output of eighteen laborers working full-time in our industrial plants. The blueprints for tomorrow's victories are being carefully drawn to scale in our factories today.

The strong young men in our Army and Navy possess fighting qualities that are unexcelled anywhere at anytime. Their stamina, courage, and devotion to duty have so brilliantly been proven at Pearl Harbor, on Wake Island, and on Luzon in the Philippines.

But our boys cannot knock down enemy planes with slingshots. They cannot fight tanks with clubs. They cannot attack enemy fleets from rowboats. No amount of patriotism, bravery, and ability can succeed in battle without the tools of war. The production of those tools now depends upon industrial America. The worker in the chemical plant, the steel factory, or on the bomber assembly line is an indispensable corollary to the American soldier in this fight to preserve the Democratic way of life.

Chemistry is a priceless ingredient of industrial production. It was in the chemical laboratory where much of America's productivity was born, grew out of its swaddling clothes and entered maturity. Our chemical plants hold a vital place in our war program, and they must be safeguarded at all costs.

There are persons in the United States who would undermine our wartime efforts. Spies and saboteurs have been sent here to gather vital information and to slow down our production as much as possible. I am glad to say that American law enforcement, in cooperation with loyal citizens, has the situation well in hand.

From September, 1939, until the United States entered the war, surveys were conducted by the FBI of 2,280 key manufacturing establishments designated by the Army and Navy as being vital to the national defense program. Suggestions designed to afford a maximum of protection were formally submitted to the officials of each plant. The sole purpose of the plant surveys was the prevention of espionage and sabotage. The FBI had no interest in legitimate employer-employee relationships.

As a further aid to protect vital American industries over 25,000 copies of a confidential booklet incorporating the basic principles of protection against espionage and sabotage have been furnished to reliable plant officials, law enforcement officers, railroads, airlines, and steamship companies.

American industries, accustomed to a peaceful and secure nation for so long, have naturally been slow to observe all the basic precautions in guarding against sabotage. In making surveys of the physical plants, Special Agents of the FBI discovered many interesting situations which illustrate this tendency for carelessness.

In one particular plant manufacturing a secret type of war material there was a standing order that those in charge of engineering were to guard blueprints and other important data with the greatest of care. The order was followed to the letter and each night the confidential plans were locked in a burglar-proof concrete

A portion of the fingerprint files section of the identification division.

vault. When the FBI's Special Agent conducting the survey looked over the vault he found it was impregnable except for the fact that a window of ordinary glass had been built into the rear wall of the vault. The window overlooked a small landing leading to the yard of the plant, and it would have been a very simple matter for an espionage agent to have entered the vault and removed the whole collection of confidential plans. The situation was remedied immediately when it was brought to the attention of the plant officials.

Upon beginning the survey of one plant the Special Agent performing the work entered at each of its three entrances in succession without being questioned by anyone even though he wore no identifying badge. He then toured the entire factory and mingled among the workingmen and technicians but still no one stopped him. He poked around among highly confidential activities, asking curious questions and receiving courteous answers. Still no one asked his identity or purpose. In order to insure the proper protection of this plant, the FBI recommendations at the conclusion of the survey included the suggestion that each employee and official be issued a credential card.

Railroads, truck lines and automobiles offer the would-be spy or saboteur possible means of entry to important industrial plants. In a vital facility surveyed by the FBI, it was found that the main line of the railroad extended along one boundary of the plant premises and that there was no fence or other barrier separating the right of way from the company property. In fact, there was very little fencing in the more than two thousand acres comprising the premises of the establishment. Outsiders had ready access to the plant both from the railroad property and from the numerous public roads which ran through the grounds.

In addition to the necessary fencing, it should be one of the duties of the plant guard force to take proper precautions so that unauthorized persons will not enter the premises on incoming trains. A guard should accompany the train at all times when it is within the plant area. After all the cars have been loaded or unloaded, as the case may be, they should not be permitted to stay within the plant enclosure inasmuch as they offer an inviting hiding place for intruders.

By providing loading platforms and warehouses near the boundary line of the company premises, much of the necessity for trucks having to enter the plant proper is avoided. It is desirable to have parking areas available outside of the plant property so that workmen and visitors will have to enter through the plant gates on foot, thus enabling the guard on duty to scrutinize them more closely than if they entered in automobiles.

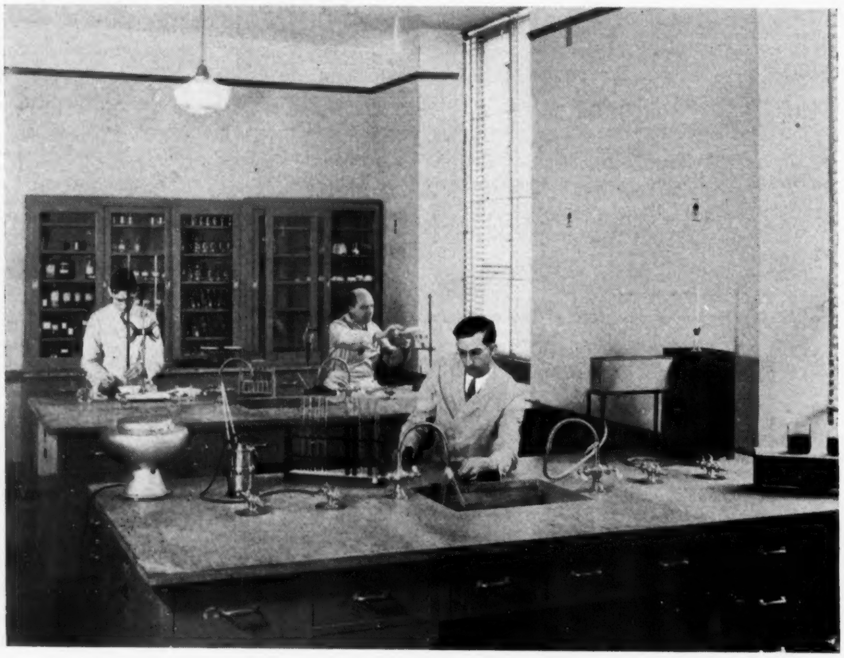
Proper fencing and an alert guard force are not always sufficient to protect against unwarranted trespassers. Sewers and drainage outlets offer avenues of entrance. In one factory surveyed by the FBI it was found that a water drain located at the foundry offered a possible means of ingress for one bent upon destruction of machinery or other property. The suggestion was made to the company officials that the drain be properly barricaded with a grille.

Foreign agents in their attempts to thwart our wartime efforts will exhibit untold ingenuity in their operations. Even greater ingenuity must be exercised by plant officials in preventing their entry into industrial establishments.

There has been no evidence of foreign directed sabotage in the United States, although several individual acts of damage have been perpetrated. Looking at the nation as a whole, there has so far been a negligible amount of sabotage in the United States in comparison to the amount of this type of damage done during a similar period prior to and after America's entry into the first World War.

There is much management can do to protect against any form of sabotage. Each plant, of course, presents individual problems that must be determined upon the basis of local conditions.

Technicians analyzing evidence at the technical laboratory of the FBI.



General view of the U. S. Department of Justice building, Washington, D. C.

The saboteur operates in as many ways as there are methods of disabling plants, damaging materials and supplies, crippling power and interfering with the manufacture of every type of product in a modern industrial community. Generally speaking, physical acts of destruction may be divided into three primary groups—arson, explosions, and mechanical sabotage. Some of the forms of sabotage are:

1. Damage to machines and other equipment by breakage, chemicals, foreign bodies or abrasives.
2. Destruction of important machinery, buildings, or equipment by time bombs or the use of other explosives.
3. Damage to power stations, switchboards, or other key points of the power system.
4. Injury to materials being used or manufactured at the plant, including raw materials.
5. Arson, which includes the creation of fire hazards and undue negligence.
6. Bacterial infection of water and foodstuffs to be consumed by employees or foodstuffs being manufactured on contract.
7. Theft or damage to blueprints, formulae, working models, or other confidential materials.
8. Damage or destruction of main transportation routes.
9. Injury to precision tools or technical mechanisms.

These are potential sources of trouble which plant managements should guard against. By carefully studying a particular plant's difficulties, as well as the general points outlined above, management can more easily organize its anti-sabotage program.

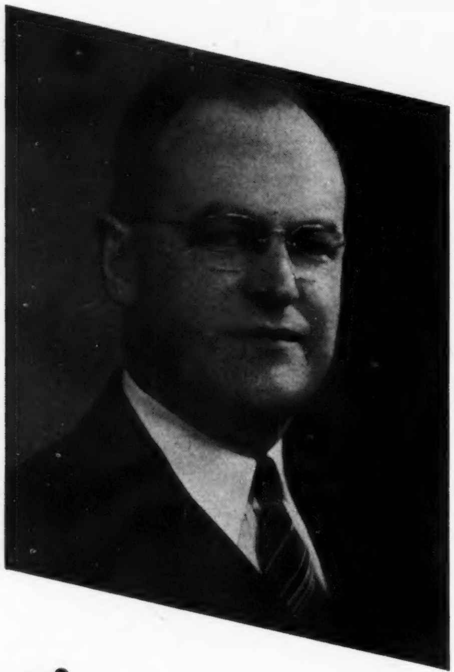
The FBI's Technical Laboratory which was organized in 1932 is playing a vital role in national defense. Last year approximately fifteen thousand examinations were conducted, these involving over forty-two thousand specimens of evidence. In many instances chemistry or microchemistry, with its miniature utensils and instruments and specialized procedures, has come into play. The Laboratory examination may show that sabotage was committed or could have been perpetrated, and here it is of evidentiary value in the prosecution of the guilty parties. At the other extreme the technical inquiry may discount the theory of sabotage and thereby terminate an investigation. Another possibility is that the Laboratory experts will be able to narrow the field of inquiry.

Only recently several strips of white chemical substance enclosed in a small glass tube were received in the Laboratory. The material was taken from an alien who had sought employment on a government project, and attempted sabotage was suspected. Contrary to the claimed innocence of the substance, chemical tests in the Laboratory revealed it to be metallic sodium covered with a coat of sodium peroxide. The sabotage possibilities of this material are well-known.

In another case it was reported that a young man who failed his physical examination for induction into the Army had been taking pills which would affect his heart. Inasmuch as the physician who prescribed the medicine for the youth's mother claimed it was for rheumatism and had no perceptible effect on the heart, sample pills were forwarded to the FBI's Technical Laboratory for chemical examination. The physician's opinion was substantiated. Another examination revealed a definite murmur in the young man's heart.

The free nations of the world are engaged in a life and death struggle against the military despots of Europe and Asia. The production lines of the United States —now the arsenal of universal freedom— must not be slowed. If a key laborer loses but one day of work, ultimate victory is that much harder to attain. An act of willful sabotage now is a crime of most serious import, and plant management must do everything possible to prevent such criminal damage

The test of whether or not Democracy can survive now faces the United States. Upon the outcome of this war depends the realization of the hopes and prayers of millions of people, both in this nation and in others. Of the outcome there can be no doubt. The fighting men of America, with the help of industry will insure our victory.



Did the American chemical industry "jes grow" like Topsy or have there been specific economic reasons which determined the directions in which expansion has taken place? Our author traces and interprets the close relationship between economics, products produced and selection of the manufacturing processes.

By Frederick W. Adams, Mellon Institute of Industrial Research

Status of Manufacture of HEAVY CHEMICALS

A DISCUSSION of the status of the manufacture of heavy chemicals in the United States is of particular interest because of the important role played by these products in their relation to the process industries. An exact definition of heavy chemicals is difficult to formulate because certain materials which may be fine chemicals or chemical oddities at present may in the near future fall under the classification of heavy chemicals. A rather loose definition, which appears to be helpful in this connection, is that heavy chemicals represent those intermediate materials of low cost, produced in large tonnage from basic raw materials for use in the process industries. No exact limits can be set forth, although, in general heavy chemicals fall in the price range between ten and one hundred dollars per ton; similarly, the output may run from a few thousand to several million tons a year. It is thus seen that they overlap certain other chemicals, for example, ethanol, which falls in the middle of both the price and tonnage ranges just mentioned. Typical examples of heavy chemicals are: sulfuric acid, muriatic acid, nitric acid, soda ash, caustic soda, ammonia, salt cake, niter cake, niter, and chlorine. It will be clear that some of these materials, such as soda ash, salt cake, and niter, are classified here as heavy chemicals because of the location and methods of manufacture, although it is realized that they may be commercially mined and that, where obtained from natural resources, they more logically come under basic raw materials rather than heavy chemicals.

The manufacture of heavy chemicals is characterized by the low profit margin per unit, the large production volume, and the almost inevitable occurrence of by-products. It is therefore necessary to find outlets for the by-products for their profitable disposition and this action often requires passing through a variety of intermediates to obtain marketable goods. Heavy chemical operations are continually in a state of flux; obsolescence of raw material or process may develop overnight with an apparently minor change in the balance between supply and demand and hence cost of some related material. The difficulty from corrosiveness and the expense in handling and transporting many heavy chemicals limit the distance of prospective markets and stimulates an integration of chemical manufacture in a large number of restricted localities serving markets within an easy shipping radius. To appreciate fully the nature of the heavy chemical industry as it is organized today, requires an historical background of its growth.

The heavy chemical industry may be said to have had its beginning somewhat before the end of the eighteenth century when the wars in Spain prevented importation of natural soda into France. The Leblanc process was developed to supply the need for soda in the manufacture of soap. The production of sulfuric acid and salt cake are essential steps in the Leblanc process. Sulfuric acid, made by the chamber process, was reacted with salt to produce salt cake and by-product hydrogen chloride. The salt cake was subsequently reacted with a mixture of coal and limestone to produce black ash, from which the sodium carbonate was recovered by leaching and crystallization. Thus, in the earliest heavy chemical plant, the production of acids and alkalies was carried on together.

The next important development in the heavy chemical industry, occurring shortly after the middle of the nineteenth century, was the invention of the ammonia-soda process for producing soda ash. This process, based also on salt and limestone, but using ammonia instead of sulfuric acid in effecting the conversion of sodium chloride to its carbonate, was revolutionary in that it divorced the production of alkali from the production of acid. Thus it became possible for the development of an alkali industry devoid of interest in the production of sulfuric acid and its allied heavy chemicals, and free from the transportation and corrosion difficulties encountered in the handling of acids. Toward the end of this century, the development of electrolytic processes for producing caustic soda, which to a large extent occurred initially as an adjunct of the pulp industry, pulled the alkali and acid industries still further apart. The electrolytic process for the

production of caustic soda made available large quantities of chlorine which could be shipped, without too much difficulty, to the process industries. Furthermore, the production of synthetic hydrochloric acid, by the use of by-product chlorine and hydrogen from electrolytic alkali production, had its further effect on the economic recovery of muriatic acid in the production of salt cake.

Meanwhile, other important developments were occurring in the acid industry. The early production of sulfuric acid by the chamber process yielded an acid of low strength, suitable for the manufacture of Leblanc soda and for the treatment of phosphate rock to produce fertilizer, as well as miscellaneous minor uses. Shortly after Perkin's discovery of aniline in 1856, a synthetic dye industry had its beginning. As this industry grew, a need for strong mixed acids for carrying out nitrations was envisaged. The evaporation of chamber acid in platinum was costly and slow; the Nordhausen process for producing strong sulfuric acid by the oxidation and calcination of copperas was clumsy and ill adapted to large-scale production. The heavy chemical industry therefore undertook a search for a direct method for producing sulfuric acid by the oxidation of sulfur dioxide with oxygen, and this quest led at the turn of the century to the development of the contact process. The concentrated sulfuric acid and oleum produced by this new process were ideally adapted to the nitration needs of the dye and fine chemicals industries.

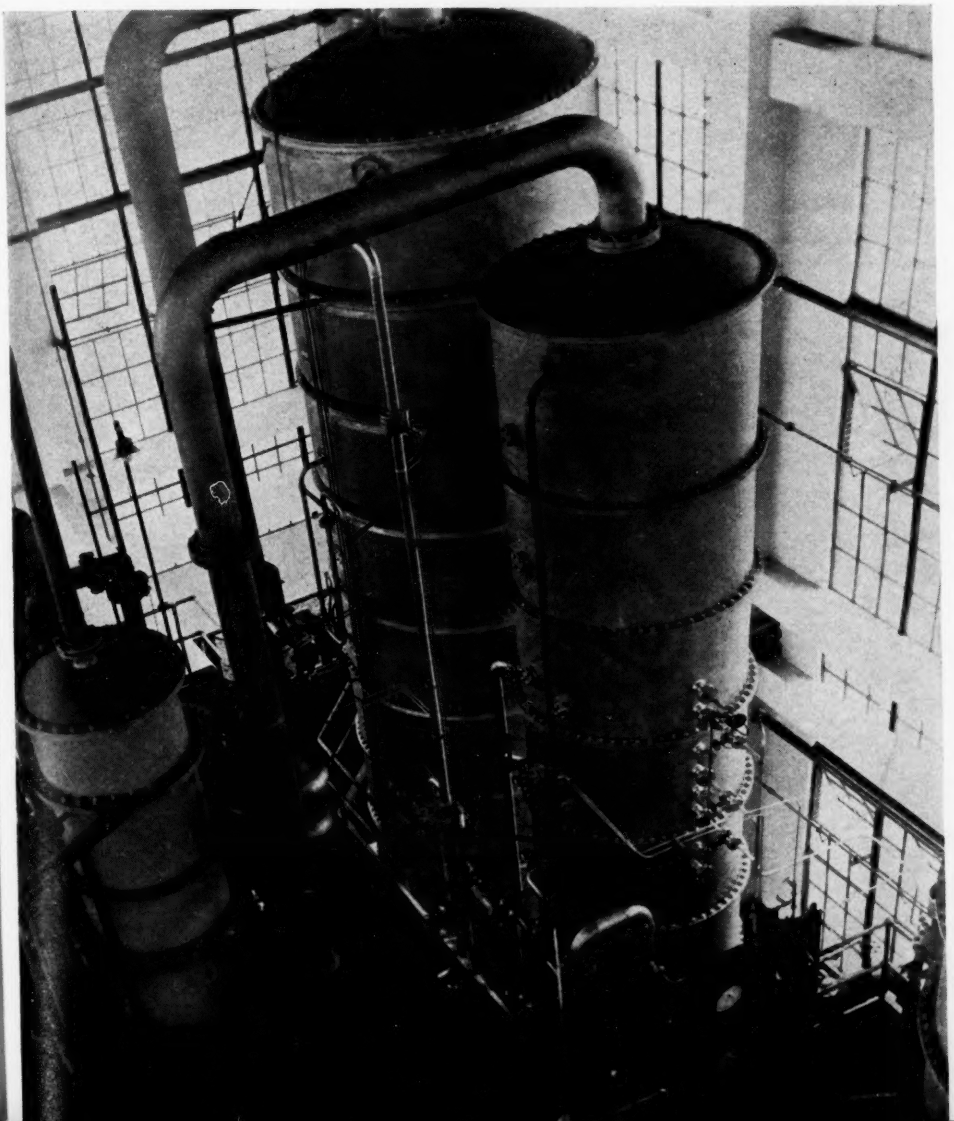
By the end of the nineteenth century, the acid heavy chemical industry had developed a business of supplying heavy chemicals to the process industries along the following lines: sulfuric acid, oleum, nitric acid, mixed acids, muriatic acid, acetic acid, niter cake, salt cake, Glauber's salt, alum, sodium sulfite, sodium sulfide, bleaching powder, bleach liquors, and aqua ammonia. Process industries producing fertilizer, petroleum, glass, steel and other metals, textiles, soap, leather, pulp and paper, coal products, and explosives drew heavily on the heavy chemical industry for their intermediates.

Because of the difficulty in transporting many of the heavy chemicals particularly the acids, the heavy chemical plant became a favorite location for producing fine chemicals requiring acid for their production. Furthermore, these more profitable products enabled the heavy chemical plant to step into a lucrative field in which its experience in the production of heavy acids and its ability to reclaim by-products were distinct advantages. The production of vanillin illustrates the close relationship and interdependence of products of the acid heavy chemical plant. Starting with benzene, obtained from the coal by-product industry, sulfonation, followed by neutralization, caustic fusion and subsequent acidification with sulfuric acid were necessary to prepare the intermediate, phenol. Nitration with mixed acid, methylation requiring dimethyl sulfate, reduction and diazotization both requiring muriatic acid, further fitted into the acid chemical industry for their intermediate materials. The by-product sodium sulfate could be used to contribute to the economy of the process. There thus developed a synthetic organic chemical industry capable of producing intermediate products for the dye, pharmaceutical, and explosives industries.

Flexibility and interdependence of operation were built up in the acid industry. Chamber plants and contact plants could cooperate most economically in the production of acids of any desired strength. Spent acids from nitrations were readily recoverable in the pot process for producing nitric acid by the distillation of a mixture of sulfuric acid and niter. The niter cake from the pot process was adaptable to the production of muriatic acid and salt cake, or could be used directly by the nickel industry in its smelting operations. Salt cake in turn was directly available for the use of the glass industry and the rapidly growing kraft pulp industry, or could be purified and sold at a premium as Glauber's salt to the textile industry or could be reduced to sodium sulfide and purified for use in the manufacture of leather and sulfur dyes.

The basic raw materials for the acid industry have varied considerably from time to time to fit current economics. Sulfur and pyrite have battled for the place of preference in making both chamber and contact acids. Whereas the older chamber process could be successfully operated using pyrite as the basic sulfur raw material in spite of its impurities of arsenic and halogens, elaborate purification systems were necessary in the contact process because the platinum contact masses initially used for the direct oxidation of sulfur dioxide were very sensitive to these catalyst poisons. Commercialization of the Frasch process for mining elemental sulfur provided a relatively pure source of sulfur, ideally adapted to the contact process, where it found extensive use. During World War I, pyrite was used in many places for the production of both chamber and contact acids. Again in the early 1920's, sulfur bid fair to eliminate pyrite from the industry, except where the recovery of by-product sulfur dioxide from smelting operations was economical. A few years later engineering developments in pyrite combustion and visible low reserves of sulfur stimulated installations

Distillation unit, showing fractionating columns, used in manufacture of synthetic alcohol, vital in both peace and war use. We need more of these.



for handling pyrite. The subsequent discovery of greater sulfur deposits and the development of vanadium catalysts with greatly simplified contact plants of higher capacity again reversed the situation.

Stimulated by the monopoly enjoyed by the Chilean Government and its control of the price of niter, processes for the fixation of atmospheric nitrogen were actively sought. War-time demands in Germany prompted the development of the Haber process for ammonia production to become a commercial reality. The technique of this process, employing high pressures, and its independence of other chemical procedures, either for the supply of intermediates or for the utilization of by-products, caused its growth in independent plant locations, although fostered by the heavy chemical industry, whose management and operators were experienced in handling operations of this type. Cheap ammonia available from this source afforded the needed raw material for the oxidation process for producing nitric acid which was developed in the late 1920's.

Many Changes Made

The direct oxidation of ammonia with air produced revolutionary changes in the acid heavy chemical industry. Chilean niter rapidly lost its importance as a chemical raw material: in fact, considerable synthetic niter prepared from the tail gases of the ammonia oxidation nitric acid process was produced and even served as raw material for the old pot process of nitric acid production. Furthermore, the use of niter for supplying the necessary nitrogen oxides to chamber plants was largely superseded by small effective ammonia oxidation units. A further "knockout blow" to the pot process for nitric acid production occurred when nickel smelters started to recover the sulfur dioxide in their waste gases and produced their own sulfuric acid and niter cake.

Following the commercialization of the synthetic production of ammonia, the use of catalytic processes operating at high pressures became profitable for preparing other chemical materials. Thus the direct production of methanol from hydrogen and carbon monoxide and high-pressure cracking processes in the petroleum industry utilized this technique, supplanting older processes.

A synthetic organic chemical industry based on these processes has recently developed, using as raw materials unsaturated hydrocarbons derived from acetylene or from petroleum refinery gases. In this industry, chlorine and hydrochloric acid became important as raw materials or by-products of some of the reactions. Therefore this development has caused an interesting drawing together of the acid industry and the electrolytic alkali industry.

Advances in petroleum refining technology followed closely high pressure and catalytic processes employed in the synthetic organic chemical industry, to such an extent that, during the present emergency, petroleum refiners have been able to jump quickly and readily into the production of toluol and synthetic rubber. While the production of low-cost products in large volume by synthetic organic chemical manufacturers represents a definite entry into the heavy chemical industry because of the close interrelation of products and by-products, which must be made to render these operations economical, similar entries by the petroleum industry are entirely secondary and merely incidental to petroleum refining.

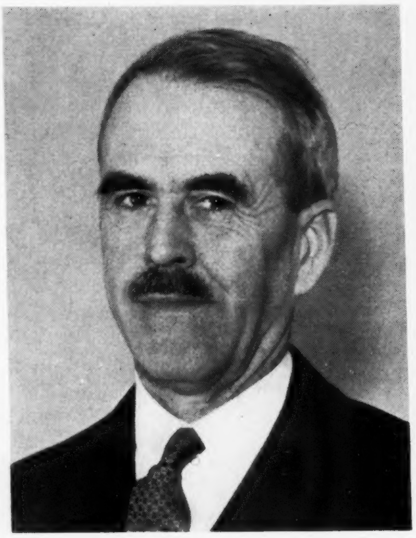
As pointed out, the chemical nature of petroleum refining operations and the experience gained in carrying them out, ideally adapt refinery personnel to the operation of heavy chemical processes. It should be realized, however, that the primary objective of the petroleum refiner is to balance economically his production of gasoline and other products to handle the large volume of crude which he has available. Any distinctly chemical operations are subsidiary to this main purpose.

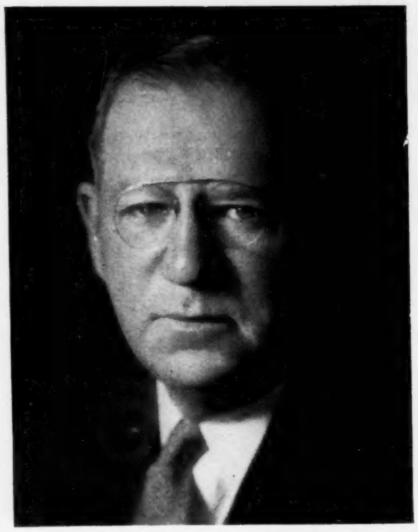
Today's Heavy Industry

Thus we see today in the heavy chemical domain an acid industry, an alkali industry, a synthetic organic chemical industry, and a petroleum industry, all contributing and competing. The position of the petroleum industry, while closely allied to the heavy chemical industry both as a consumer of heavy chemicals and a producer of raw materials for the use of the heavy chemical industry, is essentially in the business of producing and refining petroleum products, which in general are marketed and distributed along quite different lines from the heavy chemicals. A growing together and integration of the three important components of the heavy chemical industry has been gradually taking place, so that the diversified interests which once distinguished the acid industry from the alkali industry are rapidly disappearing, and in fact are meeting on common ground with the interests of the synthetic organic chemical industry.

Evidence—carloads of it—that America is producing its chemicals for war in large quantities. These tank cars are for the transportation of synthetic ammonia and synthetic alcohol, products vital in "chemicalized" warfare.

Headliners in the News





Frank S. MacGregor (left), director of the Priorities Division of Du Pont since June, 1941, has replaced Milton Kutz (right) as Assistant General Manager of the R. & H. Chemicals Department. Kutz, upon his return from several months' absence due to ill health, will assume new duties as Sales Advisor and Assistant to the General Manager of the R. & H. Department.

Monsanto Chemical Co. has formed a Texas Division which will have under its jurisdiction a plant to be operated for the Ordnance Dept. U. S. Army, and a plant to be operated for the Rubber Reserve Co. Left to right, Osborne Bezanson, general manager of the division; David L. Eynon, Jr., resident manager of the Ordnance plant; and Ralph W. Booker, project manager in charge of construction of the Rubber Reserve Plant.

Below, Julian J. Frey, manager of Ethyl Gasoline Corp.'s Technical Sales Division since 1930, who has been appointed to head the company's recently merged technical services and also the company's War Committee to adapt research facilities to the needs of the armed forces.

Below, Samuel C. Harris (left) who has been appointed Director of Sales of the R. & H. Chemicals Department of Du Pont; and Charles L. Wiswall (right) who became assistant general manager of the photo products department. Both appointments went into effect February 15.

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27th Annual Tappi Meeting Covers Vital Problems in Paper Industry

Technical Association of the Pulp and Paper Industry reported a record attendance at the 27th annual meeting held Feb. 16 to 19 at the Hotel Commodore, N. Y. City. Eighty-eight papers were presented at the three-day session. Sir Herbert Gepp, managing director Australian Paper Mills, spoke at the annual luncheon on "What Is the Future of Economic Man." TAPPI Medal Award was presented by R. A. Hayward, Kalamazoo Vegetable Parchment Co., to Robert B. Wolf, pulp division, Weyerhaeuser Timber Co.

C. I.'s photographer took these photos of personalities at the meeting.

(1) Left, W. G. MacNaughton, Newsprint Service Bureau; right, Judson A. DeCew, Process Engineers, Mt. Vernon. (2) Left, A. D. Merrill, Chemipulp Process Inc.; right, C. D. De Mers, Taylor Instrument Co. (3) Left, Jacob Edge, vice-president, Downingtown Mfg. Co.; right, Ward Harrison, Ecusta Paper Corp. (4) Left, T. E. Dial, Socony-Vacuum Oil Co.; right, George W. Craigie, field secretary, American Pulp and Paper Mill Superintendents Association. (5) Left to right, D. B. Wicker, American Viscose; C. M. Baker, Consulting Engineer; and C. R. Seaborne, Thilmany Pulp & Paper Co. (6) Left, R. T. Petrie, Black, Clawson Co.; right, J. Schenermann, Cameron Machine Co. (7) Left to right, G. P. Vincent, manager technical service & sales development; E. G. Fenrich, sales development department; and R. L. Carr, technical department—all of Mathieson Alkali. (8) Left, C. C. Van Stry, Cameron Machine Co.; right, O. C. Cordes, Downingtown Mfg. Co. (9) Left, J. R. Eldridge and right, F. G. Calkin, Virginia Smelting & Refining. (10) Left, W. F. Hoffman, Fitchburg Paper Co.; right, R. O'Donoghue, consulting engineer. (11) Left, P. S. Bolton, Clinton Sales Co.; right, Joseph J. Thomas, Rohm & Haas. (12) Left, Quincy C. Ives, research specialist; right, Charles W. Rivise, Caesar & Rivise, Phila.

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American Institute of Mining and Metallurgical Engineers Holds Annual Meeting in N. Y.

THE American Institute of Mining and Metallurgical Engineers held its annual meeting February 9-12 at the Engineering Societies Building, N. Y. City. Photos on this page were taken at various meetings and sessions

The 21st Institute of Metals Division Annual Lecture was delivered by W. Reuben Webster, Chairman of the Board, Bridgeport Brass Co. His subject was "Notes on the History, Manufacture and Properties of Wrought Brass."

Howard W. Haggard, Laboratory of Applied Physiology, Yale University, spoke on "Some Modern Problems of Alcohol," following the Institute of Metals Division Dinner on Thursday evening.

The Institute of Metals Division Award for 1942 was presented at the I.M.D. Dinner to Frederick N. Rhines, for his paper entitled, "A Metallographic Study of Internal Oxidation in the Alpha Solid Solutions of Copper." Dr. Rhines is research metallurgist and assistant professor of metallurgy, Carnegie Institute of Technology.

The 19th Howe Lecture was presented by John Johnston, Director of Research, U. S. Steel Corporation. His subject, "Time as a Factor in the Making and Treating of Steel."

The James Douglas Medal was given to Arthur S. Dwight, "for his contributions to the art of smelting nonferrous ores; and particularly for his pioneer work in developing equipment and technique for sintering such ores and metallurgical products."

The Robert W. Hunt Award for 1942 went to Harold K. Work for his paper, contributed to the Institute, entitled "Photo-cell Control for Bessemer Steelmaking."

The J. E. Johnson, Jr. Award for 1942 was given to Louis F. Sattele for his development and practical application in blast-furnace operation of fundamental slag data as described in his paper on "Effect of Magnesia and Low Alumina in Blast-furnace Slags on Furnace Operation and Desulfurization."

Top panel, left to right—T. B. Counselman, manager, Industrial Division, The Dorr Co., and Charles Locke; Max Ball president, Abasand Oils, Ltd., principal speaker at the Annual Banquet; Erle V. Davler, director; Howard N. Evenson, past president; and Henry Krumb, director

At the left, top photo—Eugene McAuliffe, newly-elected president; John R. Suman, retiring president, and A. B. Parsons, secretary. Below that, at the table—Speakers at the Tuesday session, "Ores, Metals and the War"—left to right, Wilfred Sykes, Clyde Williams, Enoch Perkins, Zay Jeffries, Andrew Leith, John A. Church, Philip Wilson, Donald H. Wallace, Paul Linz, DeWitt Smith, Charles F. Jackson, George W. Roddewig, Gilbert Seil.

Bottom panel, left to right—Harvey Mudd, director; Ira B. Joralemon and Donald M. Liddell; Earle Smith, chairman of Iron and Steel Division and Hunter Nead, past chairman; W. A. Bruce, Carter Oil Co., who delivered a paper before the Petroleum Division.

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- Polyphosphoric Acid
- Phosphorus
- Phosphoric Anhydride
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- Ammonium Phosphates
- Alkyl Ammonium Phosphates
- Fireproofing Compounds
- Calcium Phosphates
- Magnesium Phosphates
- Potassium Phosphates
- Sodium Phosphates
- Sodium Pyrophosphates
- Potassium Pyrophosphate
- Alkyl Acid Pyrophosphates
- Formic Acid
- Aluminum Formate
- Nickel Formate
- Sodium Formate
- Sodium Boroformate
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- Sodium Aluminum Sulphate
- Ferrophosphorus
- Triple Superphosphate

HERE may be the very "peg" you have been seeking to fit into the yawning hole of an unsolved problem!

Victor research chemists, during the past several years, have put together a great number of unique phosphorus compounds. Many already have been fitted into important roles in industry. Others are still waiting for assignment to their particular niche in practical commercial use.

One of these obscure phosphorus compounds may be the answer to a "sticker" for you. Its unique properties may be the very thing needed to bring an otherwise complete product up to your expectations. If not, we may have an idea how to meet your requirements.

Years devoted to specialization in phosphates, formates, and oxalates have made Victor Chemical Works the world's leading producer of these compounds. (Note list at left.) It has been our privilege many times during these years to help industry find the right "man" for the right job . . . to help solve many interesting problems with phosphorus compounds, formates, and oxalates. May we serve you, too?

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PLANT OPERATION AND MANAGEMENT

Union Potash & Chemical Co.'s plant in New Mexico mines about 2,500 tons of sylvinite and langbeinite ore a day. Chief among its products are sulfate of potash-magnesia, sulfate of potash and muriate of potash. Dorr Classifiers and Hydroseparators split the sylvinite ore and Dorr Thickeners receive overflow and recover the brine with which ore was mixed.

Digest of New Methods and Equipment for Chemical Makers

CONTAINERS AND THE WAR PROGRAM

By Maurice F. Crass, Jr., *Assistant Secretary, Manufacturing Chemists' Association*

THE present container situation has been magnified by America's unique position as the arsenal of the United Nations. Not only must the needs of our own gigantic war program be met but in addition, vast quantities of explosives and other dangerous articles must be packaged and shipped to Britain, Russia, and other Aid Countries. Our government has also made commitments to Latin American Republics for the delivery of specified amounts of vitally needed goods, including chemicals and related products. One point at least is clear. Containers will also be made available for deliveries of materials needed for the war effort and for certain essential civilian requirements. Containers will also be made available for off-shore shipments to the United Nations and to Latin America. An American manufacturer who cannot show that a substantial portion of his output is directed toward these channels is now having or will soon have extreme difficulty in obtaining requisite containers for his products.

Complex Problem

The container problem of the chemical industry is far more complex than that of other industries because of the wide variety of products produced, and because of the hazardous nature of many of these products. Inflammable liquids, combustible liquids, corrosive liquids, poisonous articles (gas, liquid, solid), oxidizing materials, inflammable solids, and inflammable compressed gases—all are classified as dangerous by government regulations and must, therefore, be shipped in a restricted list of containers conforming to rigid Interstate Commerce Commission specifications. In addition to the dangerous classification, there are many large tonnage chemical products which are essential to the war program and to essential civilian activities. Examples are soda ash, solid caustic, synthetic resin molding powders, rubber accelerators and antioxidants, insecticides and fungicides, trisodium phosphate, aluminum sulfate and alums—to name only a few. Chemical manufacturers have consequently given the subject of containers an important status in their operations and have in many cases, assigned full-time specialists to their packaging problems. Containers developed by these men have, in many cases, been incorporated into the Interstate Commerce Commission Regulations, thereby making them available to the entire industry.

Container Standardization

Container Standardization. The chemical industry has taken active measures to standardize and simplify containers and container raw materials in order to conserve strategic materials needed for the war effort. In June, 1941, the Executive Committee of the Manufacturing Chemists' Association directed that a Container Standardization Committee be formed to make recommendations on container standardization and simplification to the industry following test and study of all factors concerned. This committee has consisted principally of the chairmen of the several M. C. A. Technical Committees, and through questionnaires and industry conferences has promulgated a number of recommendations which have already resulted in substantial savings. These recommendations include:

(1) Adoption of the 13 gallon carboy in place of the 12 gallon size. Adopted by all important shippers this has resulted in an 8⅓ per cent gain in volume of lading per carboy shipped, and in addition has increased the output of the carboy bottle plant by at least 10 per cent, due to elimination of size changeovers.

(2) Reduction in sizes and types of single-trip metal drums for liquids to two—the 5 and 55 gallon sizes, with elimination of all intermediate sizes.

(3) Reduction in sizes and types of returnable metal drums for liquids to four—the 10, 20, 30, and 55 gallon sizes.

(4) Elimination of steel drums for certain dry or solid materials and substitution of multiwall paper bags and wooden and fiber containers therefor.

(5) Simplified container standards for niter cake, trisodium phosphate, aluminum sulfate, alums, rubber chemicals, and synthetic resin molding powders.

In each of the above cases, recommendations apply only to new containers, and not to containers already in service or on order. A program relative to standardization and simplification of alkali containers is now under way. The chemical industry has voluntarily adopted container standardization as an important means of conserving vital containers and container materials. At least one other industry—the petroleum industry—has undertaken container standardization at the request of the Office of Petroleum Coordinator (Recommendation No. 14). In addition, the glass container industry, on January 3, 1942, was requested by the Bureau of Industrial Conservation, War Production Board, to conserve raw materials essential to war production by simplifying bottle sizes, shapes, and finishes wherever possible.

Re-use of Containers

Re-use of single-trip containers. As early as April, 1941, chemical manufacturers experienced difficulty in certain areas in obtaining needed quantities of single-trip drums, particularly of the galvanized type. In June, the Bureau of Explosives was consulted regarding this problem. Following discussions with the Interstate Commerce Commission, the Bureau of Explosives issued a notice, dated August 7, which stated that the Commission had authorized the Bureau to permit the re-use of single-trip con-

"One thing is certain. Containers will be made available for war products and essential civilian demands"

tainers that were in good condition and not liable to permit leakage of contents while in transportation. The Bureau then listed conditions under which such containers could be re-used during the emergency, requiring that each firm submit individual application, furnishing the following information: (1) type of container, (2) ownership and source, (3) material to be shipped, (4) arrangement made for reconditioning and retesting, and (5) agreement concerning stenciling of drums, providing permission was granted for re-use. The Interstate Commerce Commission followed this up by issuing an order, dated September 20, 1941, specifically authorizing re-use of single-trip containers for domestic shipments through amendment to section 28 (h) of the ICC Regulation for the Transportation of Explosives and other Dangerous Articles. This section now reads as follows:

"*Single-trip Containers* made under specifications prescribed herein, from which contents have once been removed following use for shipment of any article, may not be again used as shipping containers for explosives, inflammable liquids, inflammable solids, oxidizing materials, corrosive liquids, or poisons, class B or C, as defined herein; provided that during the present emergency and until further order of the Commission, single-trip containers may be re-used if retested and approved for service by the Bureau of Explosives. Application for permission for re-use should be made to the Bureau of Explosives, 30 Vesey Street, New York City."

On September 4, 1941, the Treasury Department announced an amendment to articles 111 and 146, Regulations No. 3, Internal Revenue Code, to permit the re-use of embossed steel drums for completely denatured alcohol and proprietary solvents; provided that drums bearing the embossed symbol of one denaturer or producer could not be re-used by another denaturer or producer, or their agents.

The Bureau of Marine Inspection and Navigation has further co-operated by issuing an amendment to the Regulations prescribed by the Secretary of Commerce for the transportation of dangerous articles on board vessels, permitting the re-use of single-trip containers for water shipments. Issued in the Federal Register of February 18, 1942, the amendment takes the form of a special section, 146.28-2, which reads as follows: "Notwithstanding the provisions of Section 146.05-10(h), single-trip containers may for the duration of the present war, be re-used, if retested and approved for service in accordance with the regulations of the Interstate Commerce Commission in effect at the time of shipment." Advices from the Bureau of Marine Inspection and Navigation indicate that it will be advisable to identify such re-use by a notation on the shipping papers as follows:

"Shipped under authority section 146.28-2."

It is well to note that the term "single-trip container" is not limited to metal barrels and drums. Re-use of single-trip boxed carboys, Spec. IX., is also permitted for water shipments under the amendment noted above.

Metal Barrels and Drums

Metal Barrels and Drums. Of the approximately 700,000 tons of sheet steel required annually for the fabrication of metal barrels and drums, the petroleum industry in the past has taken, in the form of finished containers, about 50 per cent of such tonnage and the chemical industry about 30 per cent, the remaining 20 per cent going mainly to the foods and protective coatings industries. Approximately 40,000 additional tons of 24-28 gauge sheet is required each year by alkali producers who fabricate their own drums for the shipment of solid and flake caustic. Producers of rosin, asphalt, and certain other products manufacture at least a portion of their drum requirements. As early as June 13, 1941, the Office of Production Management requested the 13 principal steel producers to curtail production of sheet and strip steel for non-defense purposes, and use strip mill capacity thus released for plate production. Such conversion seriously curtailed the amount of sheet steel available for drums, and drum manufacturers promptly presented their problem to the O. P. M. Purchases Division, aided by representatives of chemicals, petroleum, food, and paint industries. Realizing the importance of containers to the vast armament program, the O. P. M., in September, 1941, directed the formation of a Containers Branch in the Purchases Division, later transferred to the Division of Industry Operations following abolishment of the O. P. M. and creation of the War Production Board.

OPM Supplies Steel

During August 1941, the O. P. M. Purchases Division announced a 60-day program for supplying sheet steel to drum manufacturers, such sheet to be used in fabricating containers for essential industries. The plan, which was made applicable to September and October deliveries and later extended to include the remaining months of 1941, provided that drum manufacturers submit PD-1 application forms for their requirements based upon two-thirds of a monthly average of their requirements during the first six months of 1941, such applications to be eligible for the assignment of A-5 preference ratings. To take care of requirements for the first quarter of 1942, this plan was amended to provide drum manufacturers with an allocated amount of sheet steel equivalent to approximately 143,000 tons, to be used only for domestic business. A sheet steel revolving inventory for the fabrication of export drums under General Preference Order M-45 and Preference Rating Order P-76 approximated 20,000 tons (see below). Although tonnages of sheet steel available for allocation during the second quarter of 1942 have not been made public, it is

expected that certain reductions will be made in the light of the critical shortage of steel now existing. Chemical firms who fabricate their own drums have not been included in the allocation system to date, having been directed instead to apply for preference ratings on their requirements through submittal of PD-1 forms (now PD-1A).

During the latter part of 1941, unexpected government demands for immediate deliveries of thousands of 16 and 18 gauge drums for lend-lease shipments seriously drained drum manufacturers' stocks of both sheet steel and fabricated drums, alarming shortages being especially apparent on the east and west coasts. To alleviate this condition and to provide for an emergency stockpile of available containers for further off-shore shipments, the O. P. M. issued General Preference Order M-45, authorizing the Director of Priorities to issue specific orders to drum manufacturers, directing the reservation of a designated quantity of 16 and 18 gauge, hot-rolled sheet steel in drum manufacturers' possession, for processing and delivery only as directed by the Priorities Division. To supply sheet steel to make up the resulting deficiency in manufacturers' inventories, Preference Rating Order P-76 was issued, assigning A-4 ratings for the replenishment of container steel stocks withdrawn upon order of the Priorities Director. Both orders were later amended so as to include container steel of all gauges.

Burlap Bags

Burlap Bags. The chemical industry has been a substantial user of both new and used burlap bags for many years. In 1941, over 1,500,000 burlap bags were used for the packaging of one commodity alone —aluminum sulfate. Extension of the war to the far east drastically curtailed shipments of burlap to this country and necessitated government action to conserve existing supplies, particularly for sand bag and camouflage purposes. On December 22, 1941, conservation order M-47 was issued, placing all existing stocks of burlap in the U. S. (except broken bales), enroute thereto, and future deliveries, under complete allocation. The order provided that unbroken bales in inventories could only be used for agricultural purposes, i.e., fertilizers, chemicals, and agricultural products, and forbade other uses. Of burlap enroute to the U. S., and with regard to future deliveries, the government stipulated that two-thirds be set aside for allocation and one-third for agricultural purposes, provided the armed forces did not need and request the latter. Importers were asked to specify only 10-ounce or heavier material for future delivery. Quotas were assigned bag manufacturers who produced bags for permissible uses. The order was amended on January 19 to permit manufacturers to process up to 10 unbroken bales, and provided that burlap of less than 10-ounce weight could be sold for agricultural purposes without restriction.

Faced with the urgent necessity of using other containers for products heretofore packaged in burlap, the chemical industry has successfully adapted the multiwall paper bag to many such products, and the wood barrel to others. Substitution of paper for burlap preceded the outbreak of war in some cases, trisodium phosphate being perhaps the outstanding example. For this and other commodities the paper bag of tested construction has proved to be a less costly and extremely efficient container. Use of asphalt laminated sheets or other protective treatment of plies effectively provides protection against transmission of moisture in many cases.

Multiwall Paper Bags

Multiwall Paper Bags. Requirements of the chemical industry for multiwall paper bags have more than doubled in the past year. Scarcity of steel drums and burlap bags have resulted in changeovers on a wide variety of products. One large chemical firm has successfully changed over to a 6 ply, 360 lb. basis weight bag for phenolic molding powder, thereby saving approximately 60,000 55 gallon steel drums per year. Other phenolic molding powder producers are considering similar moves. Acetate molding powder producers are now experimenting with a 6-ply paper bag of 370 lb. basis weight with 2 asphalt laminated plies, and rubber chemical manufacturers have adopted the bag in some instances for packaging accelerators and antioxidants. An important synthetic rubber producer will shortly package his product in a paper bag of special construction. Shipments of Glauber's salt have been successfully made, using a multiwall paper bag with special glassine inner ply. In 1941, soda ash producers utilized approximately 10 million 4 and 5 ply paper bags, varying in basis weight from 160 to 210 pounds. And these are but a few of the many applications of paper bags to the packaging of chemical products. It is highly important, therefore, that the chemical industry be adequately supplied with paper bags. Sufficient supplies have been forthcoming to date, although it is expected that allocation of kraft paper will eventually be resorted to in order that the packaging requirements of the chemical and other essential war industries be met. It is essential that adequate supplies of kraft paper be made available, due to the important amounts of strategic steel and burlap that are conserved through the use of paper.

Estimated requirements of the chemical industry for the year 1942, exclusive of cement, fertilizers, lime, plaster, gypsum, etc. approximate 125,000,000 multiwall paper bags, equivalent to 62,500 tons of paper. This includes paper needed to replace steel drums and burlap bags in those specific cases where changeovers are possible and practicable.

Paper and Paperboard. Action designed to save between 250,000 and 300,000 tons of paperboard per year without using any additional raw materials or supplies, was announced on November 3, 1941 by the War Production Board. Following study by the Consolidated Freight Classification Simplification Committee and approval by the Interstate Commerce Commission, reduced gauge requirements for material and broadened size limitations for finished boxes were incorporated into the Consolidated Freight Classification through amendments to Rule 41, issued in Supplement No. 17 to Classification No. 14, dated November 7, 1941. The amended requirements appear in Classification No. 15, issued January 31, 1942.

Manufacturers of packaged chemicals, drugs, pharmaceuticals, proprietary products, and soaps have co-operated with the Paper and Pulp Branch of the War Production Board in attempting to save a minimum of 25 per cent in their previous packaging requirements of paper and paperboard. Contacts with the industries concerned were handled through trade associations by a four-man industry Committee. Recommendations of the committee include (1) reduction in floor stocks of containers, (2) discontinue use of containers in excess of the standards prescribed by Rule 41 of the Interstate Commerce Commission, (3) discontinue use of solid fiberboard excepting when required by regulations, (4) reduction in number, caliber, and size of labels, cartons, inserts, wrappers, and (5) re-use of shipping cases wherever practicable.

Fiber Drums

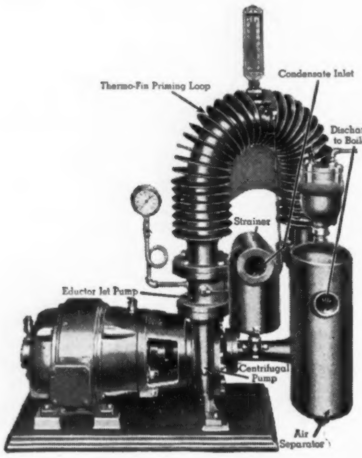
Fiber Drums. For many years, and especially so since the authorization of fiber drums as ICC specification containers, the chemical industry has been probably the largest user of this type of drum. Many regulatory chemicals, such as insecticides and fungicides, and an even larger number of non-regulatory products such as molding powders, rubber chemicals, etc. are now shipped in fiber drums. Co-operation of chemical shippers with fiber drum manufacturers has been close, and many specialized types of drums have been developed to meet specific needs. Fiber drum manufacturers are supplying many thousands of containers to the U. S. Government for use in packaging explosives and explosives materials. To date, the industry has ably met the requirements of its many chemical customers whose products consist principally of strategic

(*Continued on page 388*)

NEW EQUIPMENT

Condensate Return System QC 162

The essential engineering features of the Cochrane-Becker high-pressure condensate return system, as announced by Cochrane Corporation are that its eductor principle of operation insures thorough condensate and air removal from process apparatus making increased production possible by maintenance of uniformly high temperatures. Then, after expulsion of the air from the closed circuit, the condensate is returned to the boiler at temperatures close to that of process pressure without flash loss and with remarkable fuel savings.



The specially-designed centrifugal pump draws water from the thermo-fin priming loop and discharges it as a high velocity jet through the jet pump nozzle. This jet, striking the returned hot condensate, induces condensate flow through the mixing tube into the thermo-fin priming loop. The additional volume of the returned condensate introduced into the constantly filled loop results in the discharge of an equal volume through the air separator to the boiler.

It is claimed that the closed circuit from the boiler, through the process equipment, and back to the boiler results in quicker and more uniform heating hence increased production and improved quality. At the same time flash loss is said to be eliminated providing one per cent fuel saving for each 11-degree temperature gain.

Chemical Industries
522 Fifth Ave., N. Y. City.

I would like to receive more detailed information on the following equipment: (Kindly check those desired.)

QC 162 QC 163 QC 164 QC 165
QC 166 QC 167 QC 168

Name ....

Title .... **Company** ....

Address ....

Butterfly Valve QC 163

A recent application of the butterfly valve for emergency duty has met good reception because of its quick, automatic action according to R-S Products Corp.

This solenoid operated valve provides two-position control, either automatic opening or wedge-tight shut-off in case the electric power fails or is turned off due to any emergency. In an open position the butterfly vane is held open by the magnetic action of the solenoid. When the electric power is shut off the trigger is tripped and the counter weight closes the butterfly vane by gravity, wedge-tight against the body of the valve. It must be reset by hand.

In case of fire the valve in a gas or chemical line would be set for automatic closing. Should explosive or poisonous gases escape, automatic opening of an air pressure line would minimize the danger of personal injury or property damage.

The valve can be constructed of any metal alloy and in various sizes for air, gas, steam, oil, hydraulic and other services.

Conductivity Bridge QC 164

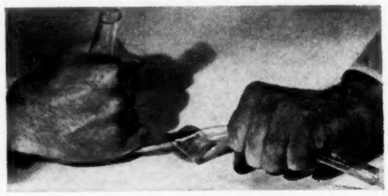
Specific resistance values up to 2.5 megohms, in six ranges, are covered by the new Model RC-1-C Conductivity Bridge announced by Industrial Instruments, Inc. Developed originally at the request of a manufacturer of organic chemicals, this adaptation of the Wheatstone Bridge permits wider application than the previous model covering values up to 250,000 ohms in five ranges.

A six-point switch covers the six resistance ranges. A single dial control provides direct resistance readings in conjunction with the multiplying factor of the range switch. Accuracy is guaranteed within 1% except for extreme ends of calibration. The accuracy is entirely independent of line-voltage variations. The A. C. bridge with cathode-ray visual null indicator (magic eye) provides for a sturdy instrument. The scale length of about 14 inches, or a total of 84 linear inches of calibration over the six ranges, permits of close readings.

Used as a conductivity bridge in connection with the proper cell, this instrument is of sufficient sensitivity to detect impurities in distilled water of the order of 1 part of chloride ion in 2,000,000 parts of distilled water. It is equally useful for the measurement of highly conductive solutions such as strong acids or alkalies. The new high range included in Model RC-1-C is especially useful for work with very dilute aqueous electrolytes and organic liquids.

Low Temperature Tubing QC 165

A new tubing with excellent resistance to brittleness down to —50° C. has been developed by the Fibron Division of Irvington Varnish & Insulator Company. This transparent tubing, known as Transflex, was made especially to secure continued, effective insulation on aircraft flying at high altitudes. Its toughness and rubber-like qualities are said to make it useful for a wide variety of other industrial and electrical applications.



Fibronized tubing is available from Size No. 24 to 1¼ inch inside diameter; its flexibility is demonstrated by the accompanying photograph. Its tensile strength is 3400-3600 pounds per square inch. Its dielectric strength (conducted on a tubing with a wall thickness of approximately .020") is 850 VPM when dry and 815 VPM when wet. Other characteristics are: water absorption, 0.4% in weight after 24 hours immersion; Wemco Oil Test (48 hours at 100° C.), not attacked; allowable continuous operating temperature, 150° F. (66° C.).

Heat Exchanger QC 166

A mechanism for heating or cooling of liquids and viscous materials is claimed by the Girdler Corporation to be unique and highly efficient. In addition to heat transfer the unit, known as the Votator, also offers mixing, emulsifying or aerating simultaneous with heating or cooling. According to the company the features are: (1) Heats or cools rapidly by patented principle of passing a very thin film of product over a relatively large heat transfer surface. (2) Continuous rapid flow of product through unit. (3) Uniform temperature, accurately controlled. (4) Completely closed system. (5) Simplicity of design, which permits easy cleaning and enables unit to be connected into virtually any processing system. (6) Economy, due to increased speed and efficiency of heat transfer, use of less heat transfer medium, and facilities for simultaneous mixing.

Cement-Asbestos Pipe QC 167

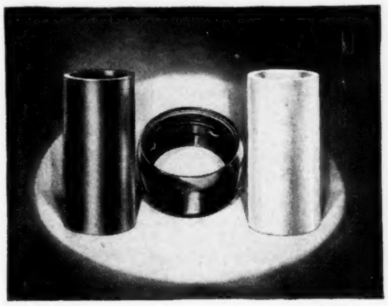
Roxite is the trade-name of a new line of cement-asbestos pipe, now being offered by the United States Stoneware Company. It is manufactured by a patented high pressure process, said to give high density and great mechanical strength.

Roxite is specially designed for the handling of a wide range of mildly corrosive solutions, for transporting processing water which must be kept free of

metallic contamination, etc. The corrosion resistance of the pipe also makes it applicable for handling fumes and gases in ventilating ducts and stacks.

For more severe duty it is also available with an impregnated or synthetic coating which offers adequate protection for many types of highly corrosive conditions. The company claims that its unique process of impregnating or coating of Roxite pipe brings to the field of corrosion-resistant materials of construction, a new and economical method of handling many processing and chemical solutions.

Several types of synthetic-resin protection are offered with Roxite pipe, each of which is suitable for a particular range of service, both in respect to the fluid to be handled and the mechanical severity of the operating conditions.



The standard coating consists of an internal and external synthetic resin finish having a thickness of about one-sixty-fourth of an inch. This coating is tough and durable to insure protection against many corrosive conditions, including resistance to practically all non-oxidizing acids.

The pipe can also be lined with Tygon corrosion-resistant lining material, having an effective thickness of about one-eighth inch. This lining offers resistance to abrasion along with immunity against nearly all chemicals, with the exception of glacial acetic acid, concentrated sulfuric acid, and chlorinated solvents.

Roxite pipe, including the coated and Tygon-lined types, are available in any length up to fourteen feet, and sizes from three-quarters of an inch up to and including eight inch I. D. On special order, ten inch and twelve inch I. D. can be had. A line of standard fittings is also available.

Jacketed Kettles QC 168

The Pfaudler Company recently announced its new "R" series of high pressure kettles of jacketed all-welded construction. Standard kettles are built for 50 lbs. internal pressure coincident with 90 lbs. jacket pressure or 75 lbs. with full vacuum. Pressures can be stepped up to 125 lbs. internal by re-inforcing openings.

PLANT OPERATIONS NOTEBOOK

CARE OF RUBBER LINED TANKS

By Herman C. Klein*

* Manager, Rubber Lined and Rubber Covered Sales, The B. F. Goodrich Company, Akron, Ohio.

1. Inspect linings periodically, and if any portions are found to be in questionable condition, report them to the manufacturer.
2. If equipment is not in use, prevent deterioration by direct sunlight and other agents by protecting it in a suitable way. In general, it is good practice to leave the solution usually handled in the container while not in use. Never fill the container with water. This practice could speed deterioration of certain grades of rubber.
3. Take necessary precautions to prevent mechanical abuse. It can often be accomplished by the use of wood, brick, lead, or alloy bumpers or ledges. Bear in mind that rubber linings are for corrosion resistance and should not be expected to give structural strength.
4. Avoid extremely low temperatures or quick temperature changes. These conditions have been known to damage rubber linings, especially hard rubber.
5. Do not change service conditions radically without first consulting the supplier of the rubber lining. Such changes are sometimes detrimental to certain types of rubber.
6. Keep the unlined portions of tanks well painted, to prevent corrosion from the outside due to splashing or fumes.
7. If the liquid handled must be heated, avoid localized heating. It will cause rapid deterioration of the rubber in that area. Prevent impingement of steam on the rubber.
8. If mixing of liquids in a tank develops heat, provide proper agitation to prevent excessive temperatures in any one place.
9. Keep oils and solvents away.
10. For maximum life, rubber linings should not be subjected to temperatures over 150 to 180 degrees Fahrenheit, depending upon the type of lining. If temperatures can be reduced, the life can be further increased.

Commutator Cleaner

Film and dirt caused by heavy, continuous power loads is said to be easily and quickly removed from commutators with a new cleaning stone announced by the Ideal Commutator Dresser Company.

The stone cleans while the motor or generator is running. It is used by simply holding it against the commutator and slowly moving across the face. Does not clog, nor cut the commutator. It also cleans film from the brush seats and helps to re-seat brushes.

So called "excess color," "skin" or "film" resulting from oxidation around paper mills, chemical plants, printing departments, diesel locomotive generators, etc., are removed, only the "electric film" remains on the commutator assuring good commutation.

Regular use of the cleaning stone is said to help in keeping motors and generators on the job twenty-four hours a day and to improve brush performance, reduce noise, even distribution of brush contact drop and brush wear and reduce chattering and sparking.

Synthetic Rubber Hose

An added construction for its Type 400SS oil hose, with elimination of all natural rubber and substitution of its own synthetic rubber, Ameripol, is announced by The B. F. Goodrich Company.

This type hose is also made with an Ameripol synthetic rubber tube, but with the cover and rubber used to impregnate the body plies of natural rubber. The new design incorporates Ameripol in every part of the hose.

All the hose is thus made resistant to the action of oils, gasolines or other solvents of natural rubber. New construction is said to afford stronger adhesion of all parts with an additional margin of safety against ply separation.

NEW PRODUCTS AND PROCESSES

By James M. Crowe

A NEWLY developed method of processing that extends the volume of latex from fifty to three hundred per cent (depending upon the particular use to which it is to be put) while retaining the major characteristics of the original product as well as a good proportion of its natural strength is of vital importance to users of latex for cementing, impregnating and coating purposes. After being extended by this process, normal (38%) latex is returned to its owner in the form of a 37 per cent concentration; and concentrated (60%) latex is returned in the form of a 55 per cent concentration.

Developed in the laboratories of the Union Bay State Company, the process makes use of a filler material of such fine size that it is said to blend extremely well with the rubber particles. This blending characteristic, together with the filler material's many points of similarity to latex—it responds to the same reagents, has the same wetting out properties, penetrates and dries in the same manner, and is susceptible to vulcanization—makes the extended product readily adaptable to most customary cementing, impregnating and coating operations.

Toluol Substitute

Notol No. 1, a product of the Neville Co., is a hydrocarbon solvent, high in aromatics, which is said to be finding favor in commercial application by industrial users as a toluol substitute. This solvent, like the same company's Tollac solvent, is produced in accordance with the specifications of United States Patent No. 2,229,328.

The nitrocellulose tolerance of Notol No. 1 is within 80% that of toluol. Hence, it may be used with but slight change in formulation as an effective substitute for toluol. In some instances, it may be found that the slightly more rapid initial evaporation of Notol No. 1 will necessitate the use of small additional amounts of butyl or amyl alcohols to present formulations calling for Ennjay No. 1 or Solvesso No. 1.

For usual formulations in which the so-called hydrogenated light naphthas are used, no changes whatsoever are required, and the faster evaporation of the Notol No. 1 will make for more rapid drying of the resultant lacquer and for increased production.

The specifications for Notol No. 1 indicate that this product is an ideal lacquer diluent for use in the lacquer industry under the present wartime conditions.

Specifications

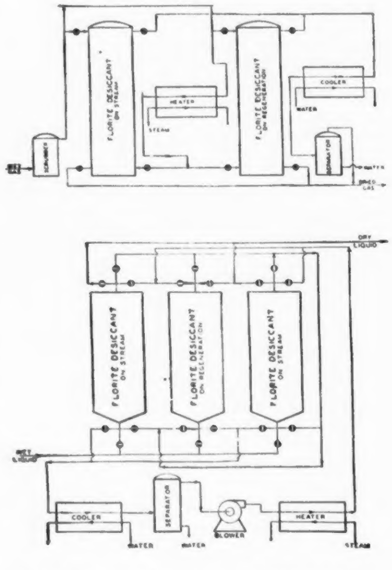
A. P. I. Gravity	39-41°F.
Specific Gravity @ 15.6°C.	.8203-.8299
Pounds per Gallon	6.910-6.830
Kauri-Butanol Value	75-78 (Benzol=100)
Nitrocellulose Dilution Ratio	2.4-2.6 (Toluol=2.9)
Corrosion (Copper Dish Method)	Negative
Color	Water White

Distillation

	Degrees Centigrade	Degrees Fahrenheit
Initial Boiling Point	80.6- 83.3	177-182
50%	86.1- 90.6	187-195
90%	115.6-121.1	240-250
Final Boiling Point	132.2-137.8	270-280

Drying Material

Florite desiccant, a new granular drying agent for gases and liquids, has recently been placed on the market by the Floridin Company. It is claimed by the company that the material has been used satisfactorily in a variety of industrial processes requiring bone dry gases and liquids, and has also proved economical in many installations where high drying efficiency is not ordinarily demanded. Among the products now being successfully dehydrated are natural gas, propane, gasoline, air, nitrogen, and carbon dioxide. It may also be used in breathers for storage tanks and electrical transformers, to dehumidify air in air conditioning systems and to dehydrate refrigerants.



The illustration shows typical arrangement of system, top drawing being dehydration plant for gases and bottom one for liquids.

It is said that Florite will not swell, disintegrate, or appear wet at the end of an adsorption cycle. It is hard, stable, non-corrosive, and non-poisonous. It selectively adsorbs 4 to 20% of its weight in water, depending on the particular application, and is regenerated by heating to 300-350°F.

Impact-Resistant Plastic

Bakelite Corporation has announced the development of a new impact-resistant phenolic molding plastic, designated as Bakelite Phenolic Resin XM-15000. This product was developed to meet the needs of industry for a high impact-resisting molding material that can be preformed on automatic tabletting machines.

It is claimed by the company that this is now the highest impact phenolic material that can be preformed in this manner. When molded, it has approximately twice the shock resistance of general-purpose phenolics. Its water resistance is also good.

The physical properties of molded test pieces are as follows:

Specific Gravity—1.36. Weight per cu. in. —22.2 gm.
Tensile Strength—5000-5800 lb. per sq. in.
Modulus of Elasticity—10-13 x 105 lb. per sq. in.
Impact Strength—Energy to break ft.-lb.—.4-.5.
Impact Strength—Per in. sq. ft.-lb.—4.8-6.3.
Molding Shrinkage—.005-.007 in. per in.
Flexural Strength—8400-8800 lb. per sq. in.

Water Absorption	% Gain	% Swelling
24 hrs. A.S.T.M. method	0.4-0.9	0.05-0.1
5 hrs. boiling 2-in. disk	1.4-1.9	0.26-0.38
24 hrs. boiling 2-in. disk	3.0-3.9	0.64-0.83

Heat Resistance—Recommended for use where molded parts are to be subjected to temperatures up to 300 deg. F. (149 deg. C.)

The physical and electrical data were determined by A.S.T.M. (or standard) samples under A.S.T.M. (or standard) tests. Pieces were molded under conditions that would impart their best finished properties.

Tragacanth Substitute

The shortage of high grade gum tragacanth ribbon has caused many users of this grade to seek substitutes. The Glyco Products Co., Inc., is now offering Gomagel which is said to give the same viscosity and body in water as gum tragacanth ribbon.

Gomagel is a pure white, edible protein powder, made from freely available domestic raw materials. Its use is indicated in pharmaceuticals, tooth pastes, cosmetics, textile finishes, polishes and for all purposes where the bodying of aqueous solutions is a desirable factor.

Nitrogen Isotope Commercially Available

The Eastman Kodak Company has announced that the nitrogen isotope of atomic weight 15 is now commercially available in the form of ammonium nitrate

in which the nitrogen of the NH_4 radical has been enriched by the chemical exchange method of Harold C. Urey.

The new product may be obtained in two concentrations, 30 atom per cent N^{15} and 7 atom per cent N^{15}. It is to be sold on the basis of N^{15} in excess of normal concentration. The prices announced are 15 cents per milligram of N^{15} for the 7 per cent concentration and 20 cents for the 30 per cent concentration. Standard packaging units are 100 milligrams or multiples thereof.

Sublan

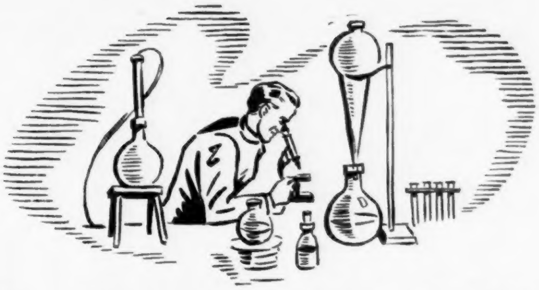
Sublan is a new material recently introduced by Glyco Products Co., Inc. It is made from domestic raw materials and is freely available for civilian use. In appearance it closely resembles lanolin, being a light colored stiff paste. It has a melting point of 55°C. to 60°C., and a surface tack similar to that of lanolin. Sublan is insoluble in water, glycerin and most water soluble liquids. It is partially soluble in alcohol and vegetable oils. It is soluble in toluol and mineral spirits in the cold, and soluble in mineral oil when heated. Mineral oil solutions form soft gels on cooling.

Because of its water insolubility, it is suggested as a seal in lines carrying water and water soluble liquids. It is of interest for the dressing, finishing and softening of leather and similar products. It is also suggested as a protective coating for metals and as a grease and lubricant.

Silico-Superphosphate

When one part of ground serpentine is mixed with three parts of newly-made superphosphate, a chemical reaction takes place and the product known as serpentine superphosphate is obtained. This product is now finding application in New Zealand, where it is being used to replace, in part, the ordinary type of superphosphate. Serpentine superphosphate contains the magnesium and silica of the original serpentine, but these are in more active form than in the original rock. It is said that the active silica in this mixture is an aid to plant growth, and the product was, in fact, first called "silico-superphosphate."

The phosphate content of serpentine superphosphate is less soluble than that in ordinary superphosphate, but is still available to plants. This reduced solubility often is an advantage in areas where the soil tends to "fix" the phosphate or render it unavailable when the phosphate is applied in the soluble form. Serpentine superphosphate thus supplies both magnesium and phosphate to the soil. It also contains some of the "trace" elements that are sometimes lacking in cultivated soils and must be supplied. The cobalt content of serpentine superphosphate is of special importance in New Zealand.—*The Chemical Trade Journal and Chemical Engineer*, Jan. 30, 1942.

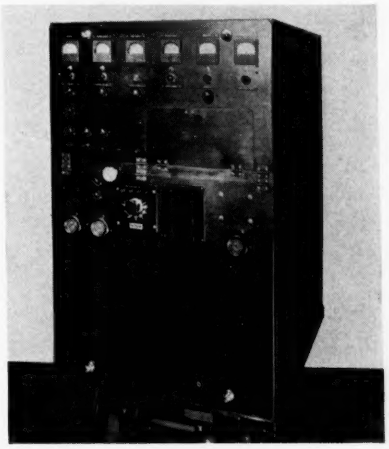


THE LABORATORY NOTEBOOK

Spectrometer for Gas Analysis

For industrial research, refineries, and chemical plants, a mass spectrometer is announced by the Westinghouse Electric and Manufacturing Company.

The unit is essentially a high-vacuum tube containing electrodes, filament, slit system, and an electron collector. The gas or vapor to be studied is subjected to bombardment by a narrowly defined beam of electrons in the order of 10^{-8} amperes. The pressure of gas in the ionization chamber where the bombardment takes place, is about 10^{-4} mm. of mercury or lower. The ions thus formed are accelerated through two narrow parallel slits in two parallel plates at a potential difference of from 100 to 1000 volts. The ions emerge from the second slit as a



narrowly defined beam of very nearly the same energy. This beam is then deflected by a uniform magnetic field designed to sort the ions according to their mass-to-charge ratio. Thus the spectrometer gives directly information about the relative abundance of different kinds of molecular ion fragments formed when molecules of a particular kind are struck by electrons of known energy.

For quantitive indication of the gas to be measured, the ions strike a metal cup connected to ground through a very high resistance. The voltage developed across this resistor is fed to the grid of an electrometer tube. This amplifies the current so it can be read with a sensitive galvanometer.

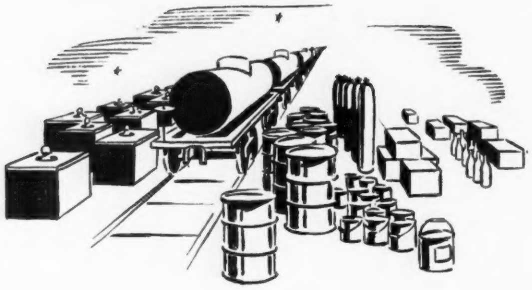
The spectrometer has been used successfully in studying patterns of organic molecules and in determining the purity of gas samples. Sensitivity in the case of air is one part in 100,000. Separation of mass 108 from mass 109 has been made.

Entire assembly is enclosed by steel panels having a black crackle finish except for the control panels which are Micarta. Panels are hinged for accessibility to all parts. The unit is mounted on a rubber-tired truck for portability. Only outside connections required are 110 volts a-c and water connections for cooling the pumps.

Illuminated Magnifier

Initially developed to examine the inside portion of a valve and to permit close inspection of the valve seat, this product of E. W. Pike & Co. consists of a set of achromatic triple lenses threaded into a Bakelite frame to permit focusing, and a special "Dalite" lamp in a plastic cylinder

which serves as a handle. At the outer end of the cylinder is a cord carrying a circuit switch and plug for connection to electric outlet. This electric unit can be substituted by a flash-light case illuminated by two dry cell batteries. It is claimed that defects can readily be seen at a distance of two feet from the eye.



PACKAGING & CONTAINER FORUM

By Richard W. Lahey

WPB Surveys Containers

AT the request of the War Production Board the Department of Commerce has undertaken a comprehensive survey of container manufacture and use, according to a joint announcement by the Department and the Board.

The survey was requested because a shortage of materials is causing serious problems in the packaging and shipment of commodities. It is designed to provide a complete picture of the situation for the information and guidance of the War Production Board, other interested Government agencies, the container industries and the public.

The survey will cover metal, glass plastic and paper containers, closures (caps, etc.), shipping cartons, wooden barrels, steel drums, wooden boxes, collapsible tubes and other containers in common use.

Inquiries will be sent to some 3,000 container manufacturers in order to obtain necessary information on packaging uses, raw materials, productive capacity and other important factors, as well as on products for which different types of containers are used and other pertinent facts.

This project will be handled in the War Production Board by the Division of Statistics and the container Branch and in the Department of Commerce by the Bureau of Foreign and Domestic Commerce and the Bureau of the Census. The Bureau of Foreign and Domestic Commerce will handle all contacts with the industries involved.

Information obtained in the survey will be used as the basis for deciding container policies. At the present time data concerning the use of various types of containers is far from complete. This makes it difficult to determine the most efficient use of the materials that are available and to ease the problems arising from restrictive orders, such as the recent tin can order of the War Production Board, which has caused considerable disturbance in the industries concerned.

It is conceivable that some commodities may have to go without containers. One of the major reasons for the survey is to determine how many shipping and consumer packages can be retained without interfering with the war effort.

Burlap Order Amended

Reports of sales of used, damaged or re-sewn burlap at prices higher than the ceilings applicable to new burlap have resulted in the issuance on Feb. 11th of clarifying amendments to Price Schedules No. 18 by Leon Henderson, Administrator of the Office of Price Administration, to prevent further misinterpretations or evasions. The amendments became effective February 7.

The burlap price schedule (No. 18) as originally issued was intended to cover not only new material, but used, damaged and re-sewn burlap as well. Since its issuance, OPA has discovered that some sellers, taking advantage of the acute demand for burlap, have been disposing of second-hand and damaged materials at prices higher than those obtaining for new burlap under price ceiling. The amendment makes clear that the schedule applies to all burlap.

In cases where re-sewn burlap is made up of more than one construction, the maximum price applicable is that at which the lowest priced component is ceilinged.

The amendment to Price Schedule No. 55, which sets ceiling prices on second-hand bags, is merely to end confusion that has arisen concerning the pricing of bags manufactured of second-hand materials. Under the original schedule, a second-hand bag was defined as one that had been used one or more times, emptied and then resold for further use as a container. Sometimes, however, second-hand bags are ripped apart and the material re-worked into smaller containers. Containers are also manufactured from re-sewn burlap. It was the status, under the price schedule, of these re-sewn and re-worked bags that had been in doubt. The amendment makes it clear that any container manufactured from second-hand material is covered by the schedule.

Editor's Comment: *Your attention is directed to Mr. Maurice F. Crass' excellent article on containers. It is a clear and chronological history of the restrictive orders and other steps taken to alleviate shortages of containers for materials entering into our war efforts. It covers all types of containers used in our industry and should prove helpful to those concerned with these problems. A notice of a survey to be made by the Department of Commerce for the W. P. B. on container manufacture and use appearing in this section may indicate how important this problem has become.* (*Page 348*)

Care of Textile Bags

Editor's Note: *The following release from the Department of Agriculture on the care of textile bags on the farms has partial application in manufacturing plants. It is published in the interest of conservation for our War Efforts.*

The care of bags and sacks has become an important economy on farms, says the U. S. Department of Agriculture, as war has restricted shipments of jute, the raw material of burlap, and the entire output of canvas and duck has been allotted for military purposes.

Practical ways of conserving bags, as outlined by M. A. R. Kelley of the Bureau of Agricultural Chemistry and Engineering, are: Pile so as to keep bags dry and so as to discourage raids by rats and mice. Prevent unnecessary wear and tear. Shake out empties so no residue remains. Store empties so they will keep dry for use again. Damp burlap rots quickly. If bags are wet hang them in the open until entirely dry. Darn and patch bags to reclaim them and keep them in circulation.

There are two simple methods of stacking bagged feed, grain, fertilizer or other materials. One way is to stand the first tier of sacks on end on a movable floor of narrow boards nailed to joists. The sacks are set far enough apart to admit air and light and to permit patrol by cats and small dogs. The air keeps the bags dry. The light, cats and dogs keep down inroads of rodents. Space and light also decrease the number of cuts by rats and mice. Other tiers of sacks are laid flat, each tier at right angles to the previous tier, an arrangement which admits air and light. A

(*Continued on page 386*)

NEW CHEMICALS FOR INDUSTRY

Roxalin Flexible Finishes, Elizabeth, N. J., has introduced a new transparent liquid coating that prevents flying glass splinters due to concussion and vibration. It is called Roxaneal. M. A. Dorian, chief chemist, is demonstrating the new material which does not obstruct light and is easily applied by brushing.

Digest of Chemical Developments in Converting and Processing Fields

Company's plant in Maryland which produces active carbon for industry.

Active Carbon in Crystallization Processes

By Martin Faye and Ralph A. Hagberg
Industrial Chemical Sales Division
West Virginia Pulp & Paper Company

The tonnage of active carbon used in the purification of organic chemicals steadily increases with the rise of the organic chemical industry. This article takes up the purification of crystalline organic substances where active carbon seems to get its most extensive workout.

WITHIN recent years, the tonnage of active carbon being used in the purification of organic chemicals has steadily increased. No doubt, the greatest reason for this increase is the fact that it has grown along with the organic chemical industry, where each day some new product is being introduced to the trade. However, another important reason is the fact that purification with active carbon is more and more supplementing older methods of purification.

When a purification problem arises, the organic chemical manufacturer seeks a method which gives him the purest product at the lowest cost. Conventional

TABLE I

Sample	Yield	Melting Point	Color
1. Gallic Acid Technical.	....	237-239° C. with decomp.	Tan-Gray
2. Gallic Acid Recrystallized from water alone.	58%	243-245° C. with decomp.	Tan, Flesh Colored
3. Gallic Acid treated with 1% Active Carbon.	63%	244-248° C. with decomp.	White

methods can be considered i. e., distillation, crystallization, chemical bleaching, sublimation, etc. the choice being governed by the chemical and physical properties of the substance being purified. Purification by active carbon may frequently replace or supplement any of these older methods, depending on the economics of the process and also the amount and nature of the impurity to be removed. Numerous examples can be cited where active carbon treatment is used for the purification of organic liquids. However, in view of the fact that active carbon is more extensively used for purification of crystalline organic substances, this discussion is confined to the use of active carbon in the crystallization processes.

The purity of crystalline organic compounds is generally measured by melting point, color and crystal structure. The impurities to be removed from the raw material are products of side-reactions, colloids, gum, etc. These cause a lowering of the melting point, impart an undesirable odor, color, and, in the case of edible products, impart an "off" flavor. In some cases these impurities can be removed by crystallizing the product from a suitable solvent, and repeating this operation until the desired purity is attained. However, in most cases, it is much more economical to remove these impurities from the crude liquor by adsorption with active carbon prior to crystallization.

To illustrate the benefit of active carbon treatment, let us consider a few case histories taken from our own laboratory work. Table I shows the results on the purification of gallic acid.

These results are interesting because they show that not only has the active carbon treatment given a much purer product as regards melting point and color, but also results in a greater yield. This increased yield alone more than compensates for the added cost of the active carbon treatment.

In Table II, a technical chemical of much lower purity than in the case of gallic acid is being purified. In purifying technical alpha Naphthol, a single crystallization in conjunction with active carbon gives better results than could be obtained by several recrystallizations without the use of active carbon.

In addition to improving the melting point, yield, and color, there are other advantages in the use of active carbon, which although indirect, are none the less real. In cases where active carbon is not used, and it is necessary to make repeated crystallizations from a solvent, impurities in the form of colloids, color bodies, gums, etc., become more concentrated as the mother liquor is reworked. The crystals formed from these reworked liquors frequently attain an "off" color or odor. Also, due to the fact that these impurities tend to be adsorbed on the crystal surface, the crystallization is retarded and frequently the crystal structure is "deformed." Obviously, if the liquor had been treated with active carbon prior to crystallization, these impurities would have been removed and these problems would not occur.

Besides the impurities which affect the melting point, yield, crystal growth, etc., there are also certain impurities which may be called "intangibles." These impurities do not show up in the usual physical or chemical analyses but nevertheless, can be very troublesome. An example of an "intangible" impurity is the bodies in corn sugar, which, if not removed by active carbon treatment, would cause foaming and of course this would be very troublesome when this sugar is used so much for candy making.

While active carbon is commonly employed for removal of organic impurities, it is frequently found to be of value for removing inorganic impurities. Since all active carbons contain inorganic impurities, the removal of the inorganic impurity may be in the nature of an ionic exchange and will be influenced by the character of the ash already present in the carbon. Or, it may be that the inorganic cation is combined with an organic anion to form an organic salt which is adsorbable by certain carbons.

TABLE II

Sample	Yield	Melting Point	Color
1. Alpha Naphthol Technical.	....	71-80° C.	Dark Brown
2. Alpha Naphthol Recrystallized from water alone.	53%	87-89° C.	Light Brown
3. Alpha Naphthol treated with 5% Active Carbon.	55%	90.5-92° C.	Flesh

It is not our purpose to compare these theories. The fact which we wish to emphasize is that certain active carbons will impart ash while others will actually remove ash from the substance. To illustrate, the results in Table III show a comparison in the total ash contents of two active carbons before and after treatment with crude tartaric acid. Carbon A has actually picked up ash from the solution, while carbon B has imparted ash to the solution.

TABLE III

	Ash Content	
	Before	After
	Treatment with Crude Tartaric Acid	
Active Carbon "A"	3.83%	5.08%
Active Carbon "B"	14.52%	8.01%

In view of this phenomenon, it should be emphasized that great care should be taken in the selection of the proper active carbon.

Besides choice of proper active carbon, it is also important to choose the proper solvent. In many organic crystallizations, water has proven to be the most acceptable solvent for reasons of solubility and economy. However, there are cases where solvents other than water have proven more satisfactory as can be realized when we consider the relation between solubility and adsorption. When a solvent is employed in which the solubility of the impurity is at a minimum, then the relative adsorption of the impurity by active carbon is at a maximum. When the relative solubilities of both the desired product and the impurities are nearly the same, it is quite possible that selective adsorption of the impurity will not be accomplished. The question of the influences of solubility is determined by the equilibrium that exists between the affinity of the carbon for the impurity. Also involved in the equilibrium, is the attraction for the carbon surface. All of this leads to the fact that considerable care must also be taken in the selection of a solvent.

In certain of the crystallization processes, such as the sugar industry, where large tonnages of active carbon are employed, considerable economy in the use of active carbon has been effected by employing counter-current system. A fundamental principle of adsorption is that greater amounts of impurities can be removed or adsorbed as the concentration of the impurity increases. Thus, the counter-current system is set up in such a way that the virgin carbon is applied to the partially purified product and the spent cake from this filtration is used to partially purify the crude untreated liquor. Up to fifty per cent. of carbon may be saved by a counter-current system.

CHEMICAL SPECIALTIES

New type of synthetic sizing and finishing agent for textile yarns and fabrics has been introduced by Rohm & Haas Co. Called Rhotex Size, it is a water soluble resin and chemically is the sodium salt of polymerized acrylic acid. It is designed for replacement of natural gums in sizing.

Industrial Agricultural Household

LIQUID SOAP MANUFACTURING TECHNIQUE

By Benjamin Levitt, *Consulting Chemist*

There are several kinds of liquid soap—hand soap, shampoo, liquid floor scrubbing soaps, rug shampoos, etc. This is the story of the formulation and methods of production of liquid soaps which is almost entirely in the hands of specialty manufacturers.

PRODUCTION of liquid soaps is almost wholly in the hands of specialty manufacturers, whose chief business is the production ot disinfectants, insecticides and building maintenance supplies. As a class, these manufacturers are very energetic and progressive and it should be added, they have done in most instances, an excellent job of distribution.

Liquid soap may be found in almost every public place. Lavatories of public buildings, hospitals, restaurants, hotels, clubs, gasoline stations, railroad cars, ships, athletic fields and offices of physicians and dentists.

There are several kinds of liquid soap, depending on the use to which it is put, namely, for washing the hands, such as is found in lavatory dispensers; shampoos (concentrated, such as used by barbers) and the more dilute liquid soap which is sold at retail, in small bottles; and liquid floor scrubbing soap and for rug shampooing.

In 1939, there were over 39 million pounds of liquid soap produced in the United States, having a value of about three and one-third million dollars. Moreover, this does not include packaged shampoo, which in 1937 was valued at $3,556,419 (for the variety containing soap). For shampoo containing no soap, (soapless soaps), production amounted to $1,982,305. Yet, all told, the entire value of liquid soap produced, amounts roughly to only about 2 per cent of the total United States soap production.

United States Government Specification P. S. 618 for Liquid Toilet Soap, requires that it shall be a clear solution of pure vegetable oil potash or potash and soda soap, with or without glycerine or alcohol, suitably perfumed and free from all foreign matter. It shall quickly form a satisfactory lather, and have no injurious effect and leave no objectionable odor on the skin.

The detailed requirements are: a. The material shall be a clear solution, free from objectionable odor, other than that from cocoanut oil, and shall form a satisfactory lather. b. Total anhydrous soap shall be not less than the equivalent of 15 per cent potash soap. c. Total matter insoluble in alcohol shall not exceed 0.5 per cent. d. Free alkali calculated as KOH shall not exceed 0.05 per cent. e. Chloride calculated as potassium chloride (KCl) shall not exceed 0.3 per cent. f. More than traces of sulfates and sugar shall not be present. g. All constituents shall be calculated on basis of original sample.

The above order, placed in the hands of one who knows how, is very easy of execution. However, there are tricks to every trade, and soapmaking is no exception.

Until the present emergency, cocoanut oil, with few exceptions, was almost exclusively used in the manufacture of liquid toilet soap and shampoo. However, now that the supply of cocoanut oil is daily becoming more and more curtailed, other oils will have to be substituted.

Cocoanut oil is generally used because it produces a liquid soap which is fluid even in a 40 per cent concentration, while soaps produced with other oils, jel at a much lower concentration. Thus cocoanut liquid soap may be produced in concentrated form, to conserve containers and for economy in shipping cost. Secondly, cocoanut soap produces the most profuse lather of all oil soaps. It lathers even in sea water. This liquid soap remains clear and fluid at low temperatures and may be piped to individual dispenser valves, from a central reservoir tank.

Although this soap has many virtues, it also has a few drawbacks, chief of which is that although it is produced as neutral as is consistent with complete and proper saponification, the soap is rather irritating to many people. Office workers often complain of chapped hands, which they attribute to the soap.

To produce high grade liquid soap, cochin cocoanut oil is used. This oil produces a soap which is water white and has little odor. Ceylon or Manila oil, which is the second grade, can also be used. This oil however, produces a straw colored soap, with a definite nutty odor.

To produce 720 pounds of soap in accordance with United States Specifications, the following materials will be required: 100 pounds of cocoanut oil, 28 pounds of 88-92 per cent solid caustic potash and the balance, water of zero hardness.

Small Batch Formula

In practice, this is considered a small batch, and it is usually produced on a much larger scale. However, the principle is the same whether a large or small volume is produced. Soft water is a prerequisite. This is to eliminate calcium, magnesium, iron and aluminum salts which would otherwise be precipitated by the soap and so impede filtration. Even filtration is no assurance that some colloidal particles of metallic soaps will not pass through and be again precipitated in storage.

A good supply of soft water may be obtained by means of a zeolite water softener. These machines are produced in a number of sizes. Some employ natural greensand as the softener, while others are filled with artificial zeolite which may be used with equal efficacy. After the capacity of treatment has been reached, the zeolite is regenerated with brine and the mineral may be used over and over infinitely for many years.

In large scale production, there is some economy in the use of solid caustic potash. This, however, requires the use of a potash dissolving tank and a block and chain for lifting the drums of potash into the dis-

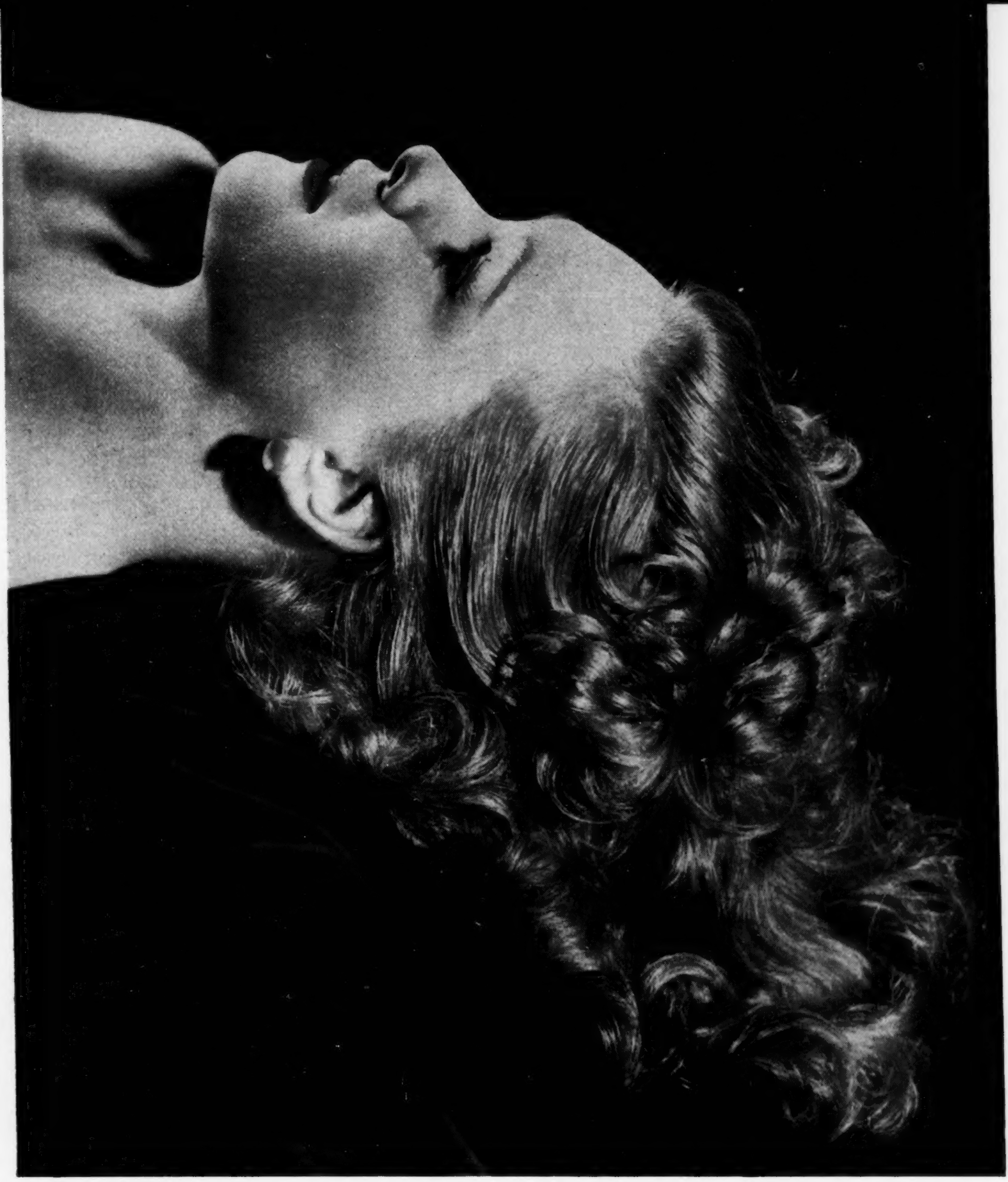


Photo by Elizabeth Arden

Beautiful hair like this is the promised result of using a good liquid shampoo.

solving tank. Caustic potash, of course, is also available in the liquid state which is attractive because of the ease of manipulation. After solution is made of the solid caustic potash, it should be pumped to a storage tank which is situated above the kettle, so that the solution may be run by gravity into a scale tank. Cocoanut oil should be melted out and pumped to a storage tank above the kettle.

The kettle may be a steam jacket steel tank with a suitable slow agitator.

Procedure

The weighed oil is run into the kettle and 50 pounds of softened water is added. These are heated to 150°F. and while agitating slowly, the equivalent of 28 pounds of solid potash is run in, slowly. The oil soon emulsifies and finally the mass becomes thick and translucent. It may then be allowed to set for an hour to complete the saponification. The soap is then tested for alkalinity. If it shows more than 0.1 per cent free caustic potash, proper adjustment should be made; on the other hand if the soap is weak the correct amount of potash must be added. Water is then added to dissolve the soap and it is finally made up to the proper volume.

Theory of saponification: The saponification number of cocoanut oil is about 252, which means that 252 mg. of 100 per cent KOH is necessary to saponify 1 gram of oil. Therefore to saponify 100 pounds, 25.2 pounds of 100 per cent KOH will be needed. Since solid potash contains 90 per cent KOH, 25.2 divided by 0.9 equals 28 pounds. Where a solution of potash is used, the per cent solution strength is used as the divisor instead of 0.9 as indicated in the example just given.

The liquid soap is now pumped from the kettle to an overhead storage cooling and settling tank. Perfume (about 1 per cent) may now be added and the soap is pumped through the refrigerating system and finally filtered.

Some authorities suggest a period of aging for about two weeks during which time the soluble impurities coagulate and precipitate naturally, in the settling tank before filtration is begun. Where refrigeration is used, the aging period may be dispensed with.

There are a number of filtering devices suitable for liquid soap. There are some filters which employ a mat of powdered asbestos, others use paper, etc. Some are pressure filters or vacuum machines, while still others employ gravity flow. The latter are slow, but produce good results nevertheless. The type of filtration equipment depends on the particular needs and no hard and fast rule can be laid down.

Suggestions are often presented by soap authorities as to the necessity of adding alcohol, for clarity. This is not true. Most liquid soap contains no alcohol, and

such addition is unnecessary when the oil has been properly saponified.

The various grades of liquid soap as sold through janitor supply houses are, 15 per cent, 30 per cent and 40 per cent anhydrous soap content. These grades may be produced as easily as that described above, by merely adjusting the water content.

Water soluble alkali resisting colors are sometimes used to give special character to liquid soap. A one or two per cent solution of the dye is made and the requisite amount is added to produce the shade desired. This is usually done at the time the perfume is added. The following colors may be used: Pink—Rhodamine B; Yellow—Metanil Yellow; Amber—Bismark Brown; Opal—Fluorescene; Strawberry—a mixture of Rhodamine B and Bismark Brown. One pound of most dyes will color 1500 gallons of liquid soap, but fluorescene will tint twice that amount.

Hospitals sometime require addition of cresol or pine oil to liquid soap so as to impart a sanitizing odor. About two per cent of either chemical may be stirred in before filtering.

Packaging: Liquid soap is sold in 55, 30 and 5 gallon drums and in gallon cans.

Shampoo

For shampoo, a 20 per cent liquid soap is quite generally used. To make the soap less irritating, part of the oil may be substituted with olive, corn, soya or any low titre oil that is available. The procedure is the same as described above. One should remember however, that all other oils produce a more viscous solution than does cocoanut oil. Consideration must also be given to the different saponification numbers of the oils used. Most of them will require less potash than cocoanut oil, as shown below.

Shampoo for the barber trade is almost always colored with fluorescene, and well perfumed. This is sold in gallon jugs or in drums to the wholesale supplier.

For the consuming public, shampoo is sold in small bottles, usually of the three to four ounce size. This requires filling and capping machines. There are a great number of these on the market. A labelling machine is also required for large scale production.

Liquid Floor Scrubbing Soaps

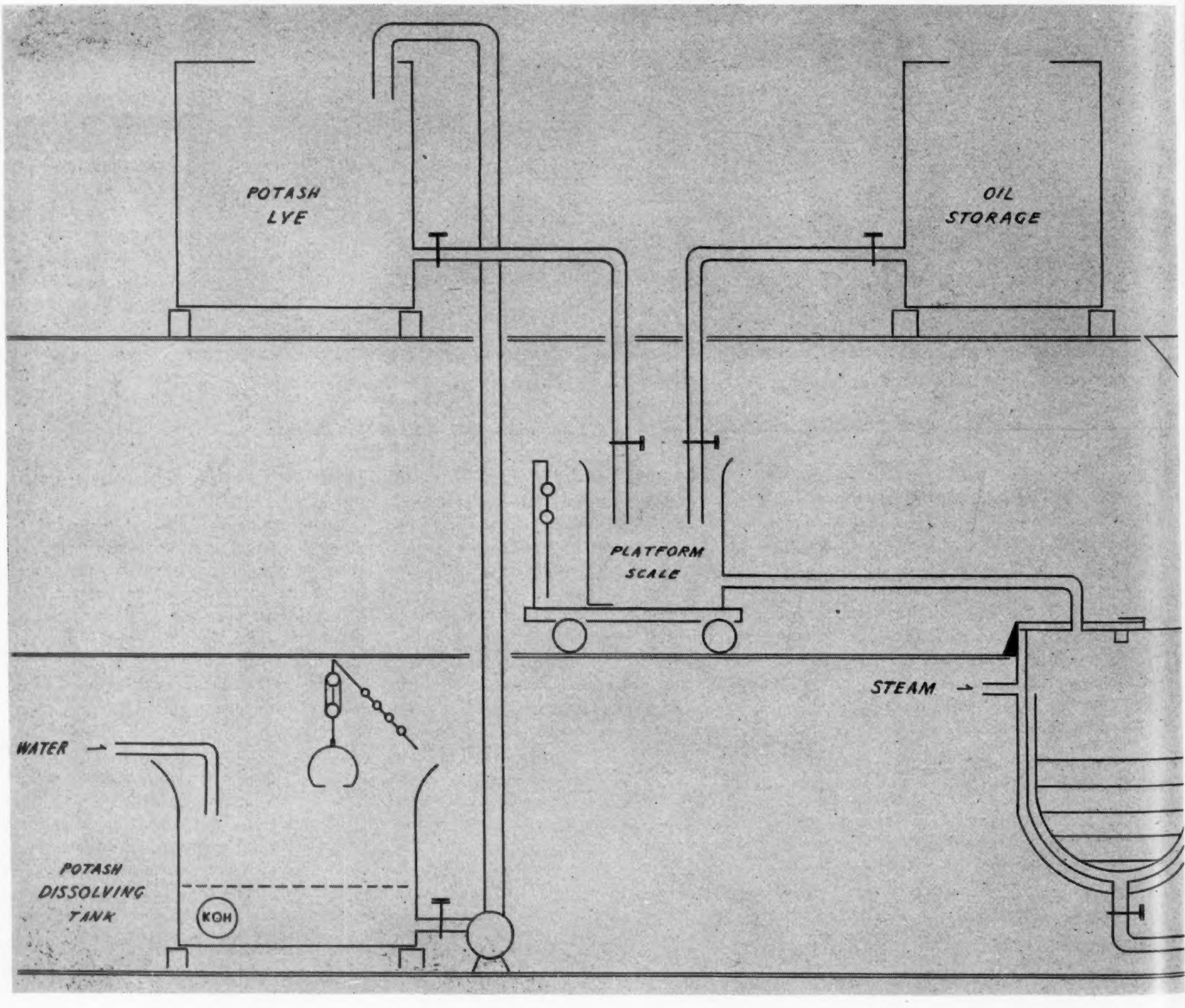
Liquid scrub soaps are generally produced by saponifying linseed, corn, soybean oils or combinations of such with potash and diluting to 15 per cent concentration of anhydrous soap. Between two and five per cent steam distilled pine oil is added before filtration. This soap is used for scrubbing and mopping floors in public buildings and for shampooing rugs.

Scrub soap is also sold in pint and quart bottles and in gallon cans for household use, such as cleaning painted woodwork, rugs, etc. Explicit directions for rug cleaning should be given on the label of the container. This type of soap is usually sold in department stores, and by janitor suppliers.

Oils Other Than Cocoanut

In saponifying oils other than cocoanut, it should be borne in mind, that consider-

Below, a typical liquid soap plant drawn



ably more intensive boiling is necessary. The lye must be added little by little until it is entirely combined with the oil. Each addition is made only after the oil has taken up the potash which has been added previously. When complete saponification has been reached, the mass becomes thick and transparent. Then water is added to proper dilution.

All of these directions may be entirely satisfactory when the oils mentioned are available at a price justifying their use in the manufacture of soap. On the other hand, the War Production Board may forbid the use of oils in processes where glycerin is not recovered. This should not be extended to liquid soap manufacture because the entire consumption by this industry is such an infinitesimal portion of the whole soap industry. Availability of cocoanut oil, is another consideration of prime importance.

In this respect relief may be had by resorting to Babassu oil from Brazil, although the supply is small. This is the best substitute for cocoanut oil. There is also some palm kernel oil from Latin America which is interchangeable with cocoanut oil.

John A. E. Orloski, writing in the December 27, 1941 number of *Foreign Commerce Weekly,* hails Brazil as the world's greatest potential producer of vegetable oils, but he adds that Brazil has as yet not benefitted materially in this respect because this source of wealth has neither been well surveyed nor exploited. He estimates that under proper exploitation, the babassu nut can become five times more valuable to Brazil than its coffee crop. While we should positively help Brazil to develop this commodity, our major difficulty at present is lack of transportation.

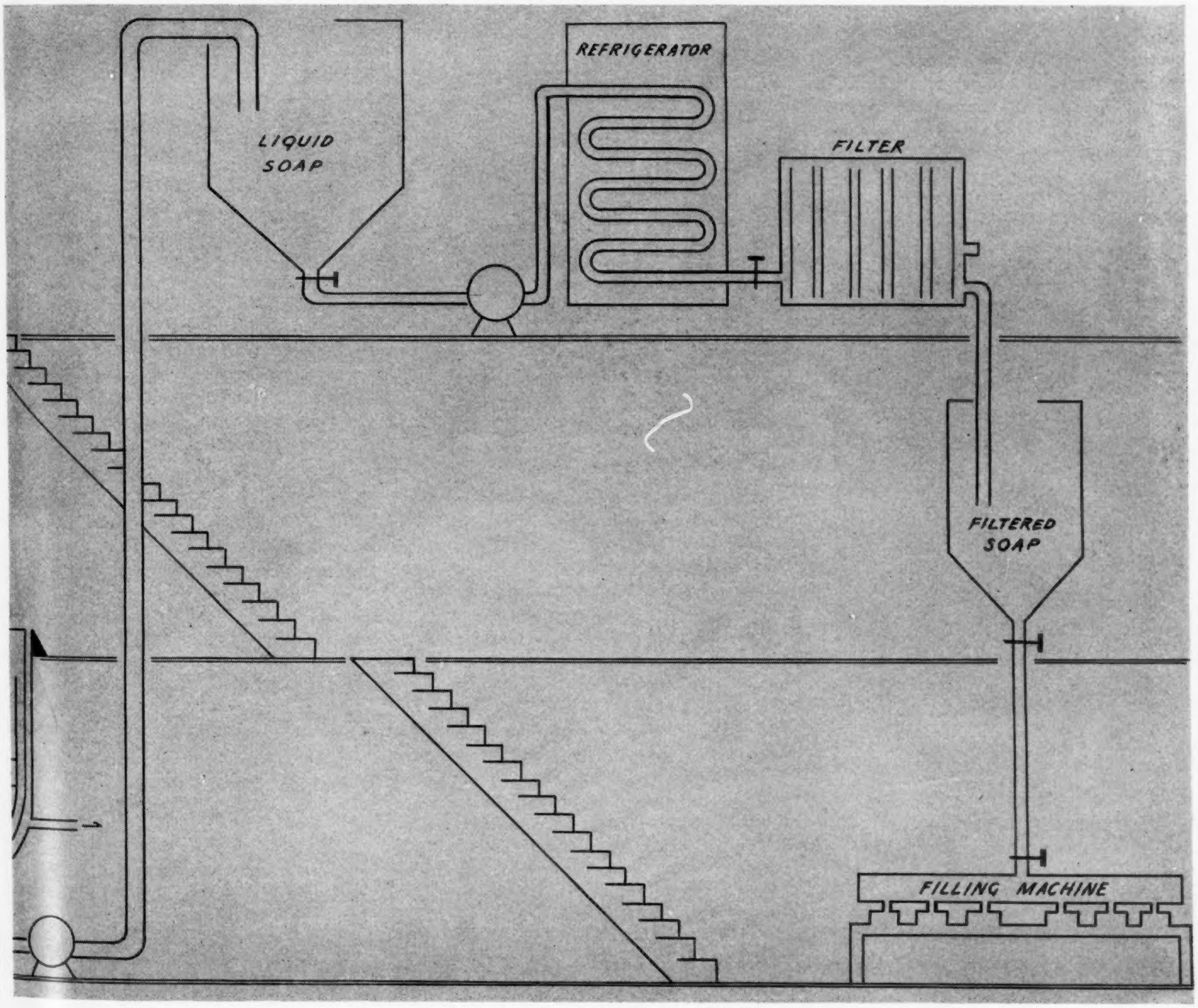
As substitutes for the oils there are the fatty acid byproducts from refining of the edible oils. There are also a number of distilled isolates from fatty acids. Red oil (oleic acid) either alone or in part makes a good liquid soap.

The following oils may be suggested:

Oil	*K #*	*Iodine Val.*	*Titre °C.*
Babassu	239-246	16	23
Castor	181	85	. .
Cocoanut	252-260	8	23
Corn	187-193	111-128	20
Cottonseed	195	112	33-36
Linseed	188-195	175-202	20
Oleic Acid	200	90	6
Olive	185-196	79-90	20-22
Palm Kernel	248	13	23
Peanut Oil	186-194	88-98	27-30
Rapeseed	175	100	12
Sesame	188-193	109-112	23
Soy Bean	189-193	122-135	20
Sunflower	189-194	120-136	17-20
Teaseed	196	90	20

It is realized that for the present at least, some of these oils are not available. Prices on most oils range from 12 cents per pound upward. An attempt is being made by Washington to stabilize prices and set a ceiling. Prices of soap will of course depend on the price that the soaper has to pay for oils and as always, the consumer pays the bill.

from a flow sheet submitted by the author.



CHEMICAL SPECIALTY COMPANY NEWS

Gulick Urges Preparation for Post-war Era

WISE policies now and after the defense period can prevent widespread unemployment in the post-war era, Charles P. Gulick, president and chairman of the board, National Oil Products Co., Harrison, N. J., pointed out in his latest "letter-to-employees."

"Most of us are seriously concerned about what will happen when the war is over," Mr. Gulick said in his current "Talk No. 43" on "What Lies Ahead for America?" Will there be a depression? Will millions of jobs end suddenly? Is industry now expanding so fast that many plants will later have to go out of business?

"These questions can be answered. When the war is over there certainly will have to be a period of readjustment. Millions of men will be released from our armed forces. Millions of workers now making defense goods also will be seeking jobs. But this does not mean that a major depression is inevitable. Wise policies now and after the defense period can prevent widespread unemployment."

Steps should be taken now by both the government and by American industry to cope with the problems which will arise after the war, Mr. Gulick contended.

"Every company must review its own situation and do everything possible to prepare for the post-defense period," he said.

Industry's part in readjustment will require careful adherence to a broad, basic program, similar to an eight-point plan outlined in his letter, Mr. Gulick contended.

Highlights of this suggested plan included development of new and improved products; planning for the re-training of workers released from the army and from defense industries when the present emergency ends; avoidance of excessive inventories during the defense period and endeavoring to prevent customers from overbuying and making every effort to keep costs and prices down.

Five important steps which should be taken by the government to assure that money will be invested and thus create these new jobs also were outlined by Mr. Gulick. They included holding the public debt to a size which will not further endanger the value of our currency; making investments attractive by allowing those who risk their money to keep enough earnings to make the venture worthwhile and setting up tax policies which encourage, not penalize, "rainy day" reserves and savings.

Schneider Forms Tesco Co.

T. E. Schneider, for many years sales manager of the chemical division of International Minerals & Chemical Corp., formerly International Agricultural Corp., has resigned following his purchase of the detergent products division of the company's business.

Mr. Schneider's new company, known as the Tesco Chemical Co., is now manufacturing a complete line of cleaning specialties, vegetable oil soaps, soap powders and disinfectants in a new Atlanta plant.

T. E. Schneider

Tesco Chemical Co. is also acting as distributor in the southeast for several well-known companies making allied products which are widely used in the textile field.

New Reardon Container

Adoption of a new style container for water paints by the Reardon Co., St. Louis, was announced recently.

The new package is different from the style previously used by the manufacturer in that it is of the "flare" style and also in that it is equipped with a bail handle.

Reardon has its principal plant in St. Louis, and also operates plants in Chicago, Los Angeles, and Montreal.

The firm's leading brand is known in the trade as "Bondex," now available in the new style convenient pails. Other brands, also offered in the attractive lithographed containers include: Modex, Bondex Primer, Venostone and the R.W.K. brands.

These products are sold by company to jobbers who in turn distribute them to dealers, painters, industrial plants, contractors, building owners and other users of casein and water paints.

The new style pails, manufactured by the Owens-Illinois Can Co. are useful for painters as mixing buckets, janitors as scrub buckets, auto-wash boys, and the farmer as feed buckets.

City PCO's Meet

An educational and general "informational" meeting sponsored by the New York Pest Control Association and Professional Exterminators Association was held Tuesday, March 10th at 7:30 P. M. at Hotel Commodore, N. Y. City.

Included was a discussion on chemical shortages, problems of supplies and equipment including automobile tires (new and retreading).

The feature of the meeting was the discussion of the following subjects:

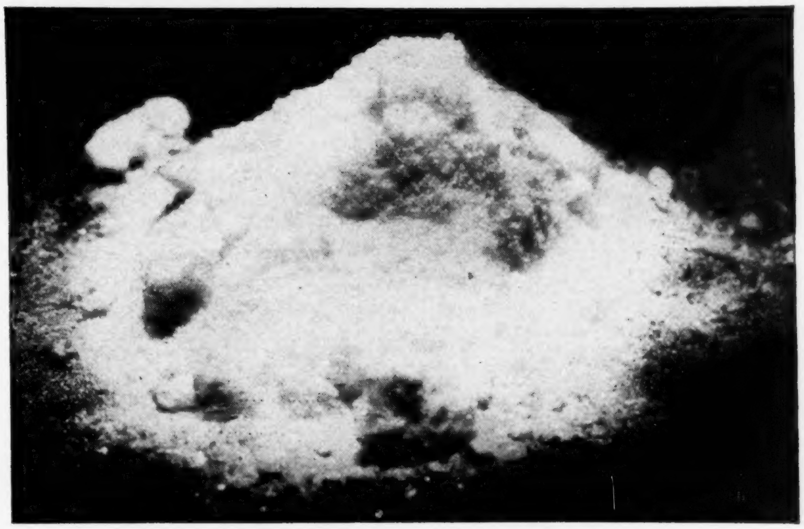
1. "Field Use of Poisons and Antidotes." Ernest M. Mills, field agent, of U. S. Fish & Wildlife Service, New Brunswick, N. J.
2. "Poisons, their Actions and Antidotes." Dr. James C. Munch, Consulting Pharmacologist of U. S. Fish and Wildlife Service; Professor of physiology and pharmacology and director of research, Temple University School of Pharmacy; author of several textbooks.
3. "Commercial Production of Antidote Kits." Dr. Joseph D. McIntyre, President, D. Jayne & Son, Philadelphia.

Arrangements were made by: Professional Exterminators Association; Joseph Finneman, President, Milford Oachs, Secretary and New York Pest Control Association; William O. Buettner, President, William J. Parker, Sect.-Treas.

ONE OF A SERIES of advertisements designed to keep you posted on du Pont products and services.

Sulfamic Acid May Help You
BREAK A BOTTLENECK

You can get it now in commercial quantities. It has many unusual advantages.



Sulfamic acid is a white crystalline solid. The pH range approaches that of Sulfuric, Nitric and Hydrochloric Acids.

Sulfamic Acid was first manufactured by du Pont during 1938. During the four years following its introduction the use of Sulfamic Acid and certain of its salts has greatly increased. Among the known applications are:

Sulfamic Acid;—Nitrite Removal—Laboratory Reagent—Leather Tanning—Electroplating & Refining Metals—Washing rinse or Fixing Agent for textile dyes.

Sulfamates;—Flame Proofing—Weed Killing—Aldehyde Addition Products—Textile Finishing Agents

"This new bulletin tells all about 'Sulfamic Acid and its Salts.' Write for your copy today (on your company letterhead, please)."

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E. I. DU PONT DE NEMOURS & CO.
INCORPORATED
Wilmington, Delaware

BETWEEN THE LINES

Need for even greater quantities of glycerine for production of nitroglycerine will spur output of soap in spite of loss of Far East sources of fatty oils, notably cocoanut and palm. Grease offers distinct possibilities.

As the full implications of the Far Eastern war sink in, with respect to a growing realization of the things this country has depended on the Western Pacific areas to furnish, there has been an understandable temptation on the part of some to go out and stock up on soap, for instance, on the theory that the shortage of basic oils from the Pacific islands will soon be felt. Understandable, but unnecessary.

The situation is in effect, working in reverse. Not because no shortage of such oils is threatened, but because of the fact. Think of the synonym for explosive force, nitroglycerine, and the answer is evident. Glycerine is needed for unprecedented production of explosives. The projected requirements for 1942, of glycerine indicate that the supply is short of such demand. Therefore it will be necessary to find more glycerine. Soap and glycerine are synonymous.

In other words there is likely to be plenty of soap this coming year. The soap will be short of glycerine, but it will be soap, and the glycerine that might normally be in the soap will be going into explosives. Carrying the circle around further, the explosives in time will be used, according to present forecasts, to blow the Japanese out of the Pacific islands that produce the oils that we normally get a part of our glycerine supply from. So, in time, there will be more glycerine. Presumably it can then be used again in soap.

Whether it will be so utilized again is one of those problems of after-the-war that can scarcely be answered here, because meanwhile many changes will be taking place; new materials, possibly new processes, and certainly some internal adjustments within the soap-making industry. Meanwhile, to get glycerine, soap production will be high.

'41 Glycerine Output—A Record

Reviewing the current fats and oils situation, production of glycerine the past year was the highest on record. Nevertheless, the projected demands both for the United States and for Lend-Lease purposes will require that, as one of the most vital products in a war economy, glycerine production attain its fullest possible expansion in this country. This level must be held not alone for 1942; additional requirements to our own, from associated nations indicate even more definitely, a shortage for 1943.

Representatives of the War Production Board are grappling with all the multitudinous problems; shipping, providing metal drums for containers, coordination of international requirements with supplies of all kinds, and fundamentally providing for additional glycerine. It is the last phase with which this article is concerned.

Supplies of oil-yielding fats are a basic need, of course. Stocks of copra from cocoanuts, babassu and palm kernel nuts are being located, in Latin American countries, Africa, accessible South Seas islands. The Philippines were a world-source of cocoanut oil, and previously to the war there, accounted for one-third of American glycerine output. Providing the WPB can solve its shipping problem, and gear ships to new supply sources and safe routes, nuts and such vegetable sources of essential oils will be available to produce the needed glycerine.

As a preliminary to dealing with a major phase of the situation, the recovery of glycerine in soap manufacture, at the instance of the WPB there was organized a Soap and Glycerine Industries Advisory Committee. With J. B. Davis as Government representative, and numbering almost a score of soap and chemical manufacturing executives and other special industry members, this group, with sub-committees, has been meeting in Washington.

Liquid and Potash Soaps

Early this month, meeting with another Government representative, G. A. Wrisley, a number of manufacturing problems were considered; specifications in liquid and potash soap manufacturing to insure maximum production, and conservation of glycerine, and industrial adjustments. The major recommendations of this group, as a result of its sessions, are doubtless already in the hands of the manufacturers concerned, or will be shortly, so need not be detailed here.

> **Glycerine and Soap**
>
> **Fortunately for our war effort Americans place "Cleanliness next to Godliness." The average American family has been using about 150 pounds of soap products a year, or about $15 worth a family of five. Strangely enough to the layman our Government is encouraging not discouraging soap production and consumption—Here are the very excellent reasons why this is so.**

One objective is to obtain 90 per cent. recovery of available glycerine, which it is believed, will offset Far Eastern losses, estimated 15-20 million pounds, when taken with other measures now projected. Large manufacturers are planning to use their extensive equipment in deglycerinizing their oils as completely as possible. Smaller producers, having less elaborate equipment and other facilities, may not be required to effect a complete recovery of the glycerine in their products, because of the relatively small quantities obtained, and probable excessive cost of getting such amounts.

A possible solution under consideration is for larger plants to make part of their facilities available to smaller units in recovering larger amounts of glycerine.

Further assistance to the smaller units of the industry contemplates making available to them supplies of deglycerinized oils, and possible changes of specifications which will permit maximum recovery. Soaps made without glycerine as a by-product will be eliminated, requiring use of materials to result in a satisfactory by-product.

Some problems inherent in this general objective, which have been considered and to some extent temporarily solved, include the fundamental one of producing a satisfactory soap, and still turning over an adequate margin of glycerine; up to the present stage substantial quantities of this component have been left in soaps, it was found, and the opinion was that its removal would not impair quality, on the ground that glycerine has little detergent value.

Liquid and potash soap manufacturers, whose product represents approximately two per cent. of the soap output of the country, have been directed to extract the maximum glycerine from their manufacturing operations, as a part of the program, and certain conservation plans will shortly become effective.

Grease as a Glycerine Source

It is calculated that at least 10 per cent. of the 38,000,000 pounds of grease used in the nation in 1941 represented recoverable glycerine. Part of the program will be aimed at adding this 10 per cent. to available supplies. The product will be salvaged from collected food fats, grease, table scraps and lubricants, part of which will be available from households, and civilian curtailments will be in order. Additional supplies from fermentation and supplies of glycerine-bearing oils from whales, among other sources, are contemplated.

Pertinent at this stage is a brief summary of certain actions at WPB or the Office of Price Administration affecting

fats and oils. Before the beginning of March the OPA revoked its Schedule Number 25, issued August 28, 1941, and intended at that time to prevent speculation, hoarding, or undue price rises in fats, oils, and their products. It is felt that such control no longer is necessary.

Fats and Oils Schedule Number 53 was revised during the preceding month, to provide that increases in ocean freight rates, war risk insurance, etc., on fats and oils shipped into or out of the United States, if actually incurred by the seller, may be added to the maximum prices of this schedule, and decreases must be subtracted. Sales of fats and oils products in finished form, and sales of such products in refined form both wholesale and retail were exempted from operation of the schedule. However, cocoanut oil was not exempted. Prices were frozen at all levels in the distributive channels, as well as at wholesale and retail points, on all crude and refined cocoanut oil.

Maximum prices on soybean and peanut oils are in effect as of February 4, under Price Schedule Number 92, by OPA, with ceilings on soybean oil based on October 1, 1941 levels, with certain adjustments and the same date level for peanut oil. Previously these oils were covered in the Fats and Oils schedule, and are now treated separately for administrative purposes. It is too early to project effects of the glycerine program, or their possible effects, on other fats and oils, or how these might occur under present policies.

However, before this appears in all probability, a full allocation program will be in force on glycerine which will restrict civilian users to 70 per cent. of 1940 consumption, provide for defense requirements and health supplies, and withdraw supplies available for anti-freeze mixtures. There will be no supplies for the latter purpose at all, it was emphasized.

As a sidelight, an official trade report to Washington has just called attention to the plight of Canadian autoists, who already have been under such restrictions; in that country the glycol type of anti-freeze is favored, and until tightening of controls affected this product, the loss of alcohol compounds was not so severe as it will be in this country. The trade report suggested to American manufacturers that if they could supply an anti-freeze mixture that neither infringed the alcohol nor glycerine bans, it would find a welcoming market. The same will now apply in the United States, obviously.

However, the War Production Board intends to watch price behavior on glycerine, and ceiling prices should not exceed general levels prevailing, it is felt. Similarly, there should be plenty of soap, even though it may not slide as easily as formerly, and again, there should be no runaway price manifestations, in the opinion of WPB and others engaged on the problem.

The whole problem of producing a soap by each manufacturer, which will continue to meet the public acceptance of the particular product and which at the same time will be meeting the primary demand of national defense now evolves on the soap industry and its allied manufacturers. The conferences at Washington evolved no new processes; those discussed were the same now in use. However, as a result of expedients now under way, the future developments may be interesting indeed—possible education of the public to use of familiar products without certain qualities hitherto associated with such products, a shift in material demands which persist, or other evolutions that are now only speculation.

WASHINGTON

By T. N. SANDIFER

(*Continued from Page 306*)

bilities at the Institute however, and at the same time, as a chemical expert of the World War I War Industries Board, he had certain invaluable qualifications for his Washington assignment.

He has now arranged, as was indicated in the February issue, to turn over his duties as chief in Washington, to his assistant chief, Dr. Ernest W. Reid, also an assistant to Dr. Weidlein in the Institute. Dr. Reid is now actively serving as chief of the Chemical Section, and Dr. Weidlein, in conformity to his desire, is serving as a senior consultant. Much of his interest in Washington centered on the development of synthetic rubber, which is now a vital concern.

Two new industry advisory groups have been announced within the month, one for the Soap and Glycerine industry, and one for Dyestuffs manufacturers.

Membership in the Soap and Glycerine Industries Advisory Committee was announced as follows, with possible additions or changes, since this has been in print:

J. B. Davis, Government Presiding Officer:

H. D. Banta, Pres.
Iowa Soap Co.
810 Valley St.
Burlington, Iowa

F. A. Courntway, Pres.
Lever Bros. Co.
Cambridge, Mass.

N. S. Dahl, Gen'l Mgr.
John T. Stanley Co.
626 West 30th St.
New York, N Y.

R. R. Deupree, Pres.
The Procter & Gamble Co.
Gwynne Building
Cincinnati, Ohio

Dan Flick, Gen'l Mgr.
Armour & Co. Soap Works
Union Stock Yards
Chicago, Ill.

Gordon Fulton, Pres.
Beach Soap Co.
Lawrence. Mass.

R. H. Giebel, V-Pres.
Harshaw Chem. Co.
1945 E. 97th St.
Cleveland, Ohio

W. C. Hardesty, Pres.
W. C. Hardesty Co.
41 E. 42nd St.
New York, N. Y.

Russel H. Young, Pres.
The Davies-Young Soap Co.
No. Findlay St.
Dayton, Ohio

E. B. Hurlburt, Pres.
The J. B. Williams Co.
Glastonbury, Conn.

E. H. Little, Pres.
Colgate-Palmolive-Peet Co.
105 Hudson St.
Jersey City, N. J.

J. S. MacIntosh, Pres.
The Holbrook Mfg. Co.
Coles & 18th St.
Jersey City, N. J.

F. H. Merrill, Pres.
Los Angeles Soap Co.
617 E. First St.
Los Angeles, Calif.

E. A. Moss, V-Pres.
Swift & Co. Soap Works
Union Stock Yards
Chicago, Ill.

A. R. Robson, V-Pres.
Fels & Co.
73rd St. & Woodland Ave.
Philadelphia, Penn.

Werner G. Smith, Pres.
Werner G. Smith Co.
2191 W. 110th St.
Cleveland, Ohio

L. Webb, Jr., Pres.
Hunnewell Soap Co.
114 W. 2nd St.
Cincinnati, Ohio

Membership of the Dyestuff Manufacturers Industry Advisory Committee:

Dr. Arnold L. Lippert of the Textiles, Clothing and Leather Goods Branch of the WPB, Government Presiding Officer:

A. R. Chantler
E. I. du Pont de Nemours & Co.
Wilmington, Del.

E. K. Halback
Gen. Dyestuff Corp.
New York, N. Y.

S. C. Moody
Amer. Cyanamid Co.
Bound Brook, N. J.

Dr. H. B Marshall
Ciba Co.
New York, N. Y.

Jack Crist
Southern Dyestuff Corp.
Charlotte, N. Car.

T. Thomas Roberts
Arnold Hoffman & Co.
Providence, R. I.

C. M. Richter
Pharma Chem. Corp.
New York, N. Y.

A series of tightening actions was effected during the past few weeks reflecting the increasing tension in all fields of supply. The following steps were reported by one or another of the emergency agencies recently:

All agar supplies in the hands of persons holding more than 50 pounds "frozen" under General Preference Order M-96. This order prohibits purchase or sale by or from persons with more than the stipulated amount, except on specific authorization by the Director of Industry Operations, WPB, or for use in bacteriological media.

Restriction on manufacture of multivitamin tablets capsules, pills or liquids containing more than 5,000 units of Vitamin A in the largest daily dose recommended by the label or accompanying instructions. Restrictions do not apply to certain therapeutic uses, which are excepted by the order, L-40.

Price ceilings set, in Price Schedule Number 104, by Office of Price Administration, on Vitamin C (Ascorbic Acid) on sales by producers, primary jobbers and resellers.

Price ceilings set, in Price Schedule Number 99, by same agency, on acetyl salicylic acid, for producers, primary jobbers, and wholesale druggists.

Price ceilings set, in Price Schedule 103 by same agency, on salicylic acid, for producers, primary jobbers, and resellers.

Price ceilings set, in Price Schedule 101, by same agency, on citric acid.

Maximum prices set, in Price Schedule

(*Continued on Page 389*)

INDUSTRY'S BOOKSHELF

Chemical Engineering for Production Supervision, by David E. Pierce, McGraw-Hill Book Company, New York. 232 p., 57 fig., 29 tables. $2.50. Reviewed by M. C. Molstad, University of Pennsylvania.

This excellent book is the first to be written as a result of the Federal Government's Engineering Defense Training program. It is based on the notes and problems prepared by Mr. Pierce and his associates, all of the Röhm and Haas staff, for the courses given by them for the operators, foremen, and supervisors in their company. Most of the students were high school graduates, but few had received any college training. The course was therefore designed to provide these men with the basic information needed to operate chemical engineering equipment efficiently, economically, and safely. The course is now in its second successful year.

The first two chapters are titled General Principles of Chemistry and Physics, and Transformation of Energy. Information basic to many phases of chemical engineering is then given in chapters on Heat Transfer and Flow of Fluids. One chapter is devoted to each of the following unit operations: Evaporation, Distillation, and Drying, these being particularly suitable for illustrating important principles. In all cases the discussion of fundamental principles predominates, rather than extended descriptions of many types of equipment.

The value of calculations in the development of an understanding of principles, is emphasized. The book contains 230 problems, and care has been taken to use dimensions and flow rates which are typical of plant equipment. Any engineering college instructor will find here problems useful in his own classes.

The book should be particularly useful at this time because of the shortage of technically-trained men in plants straining for increased wartime production. A source of manpower all too frequently neglected is the experienced operator possessing the capacity for further training. For such men an effective course can very well be based on Mr. Pierce's book.

Condensed Chemical Dictionary, Reinhold Publishing Corp., New York, Third Edition, 756 pages. $12.00.

This latest edition of a popular and well used source of chemical knowledge reflects the growth of information on new products. Six thousand new items are said to have been added bringing the total to about 18,000 listings. These are alphabetically arranged and usually give the following information: names, synonyms, physical appearance, chemical and physical properties, derivation, grades, containers, uses, typical specifications and regulations.

Some of the new features in this edition are A Guide to the Pronunciation of Chemical Names, which is a reprint of the Report of the Nomenclature, Spelling and Pronunciation Committee of the American Chemical Society; Effect of Wartime on Chemical Prices, which gives prices for December, 1913, highest price during 1st World War, price on July 3, 1939 and price on Oct. 10, 1941.

Under a new listing a comprehensive survey of vitamin information is given.

An extensive appendix gives a series of tables with valuable technical data.

SURVEY OF CURRENT LITERATURE

A-C Voltmeters. "Maintenance and Servicing of Electrical Instruments." *Instruments*, February, p. 48.

Adhesives. "Adhesive Industry Is Modernized." Use of resins and their effects. *Chemical & Metallurgical Engineering*, February, p. 121.

Agitation. "Power Requirements of Turbine Agitators." *Industrial and Engineering Chemistry*, February, p. 194.

Alcohol. "Vapor-Phase Partial Oxidation of Ethyl Alcohol." *Industrial and Engineering Chemistry*, February, p. 138.

Alkalis and Alkali-Metal Salts. "Expansion of the Trona Enterprise; Plant of the American Potash and Chemical Corporation." *Industrial and Engineering Chemistry*, February, p. 133.

Alkalis, Cement By-products. "Removing Alkalis by Heating with Admixtures." Describes tests made to show relative amounts of soda and potash driven off two dissimilar cement raw mixes when heated and to determine relative effects of a few chemical additions. *Rock Products*, February, p. 66.

Aluminum Hydroxide Antacid. *Drug & Cosmetic Industry*, February, p. 156.

Ascorbic Acid. "Extraction of Ascorbic Acid from Plant Tissues." *Industrial and Engineering Chemistry*, February, p. 217.

Cellulose. "Cellulose Content of Cotton and Southern Woods." *Industrial and Engineering Chemistry*, February, p. 224.

Cosmetic Raw Materials. "Cosmetic Substitution." Information on some of the shortages existing because of lack of imports and direction toward more important industries. *Drug & Cosmetic Industry*, February, p. 148.

Drying Oils and Resins. "Alkali-Induced Isomerization of Drying Oils and Fatty Acids." *Industrial and Engineering Chemistry*, February, p. 237.

Essential Oils. "Java Citronella Oil." *Soap*, February, p. 24.

Gasoline. "Composition of Catalytically Cracked Gasolines." *Industrial and Engineering Chemistry*, February, p. 147.

Gasoline. "Front-End Volatility of Gasoline Blends." *Industrial and Engineering Chemistry*, February, p. 167.

Glass. "The Volatilization of Soda from Soda-Lime-Silica Glasses." *The Glass Industry*, January, p. 23.

Gold and Silver. "Gold and Silver in Wartime." Discusses these metals and some of their alloys as to properties, possible applications. *Metals and Alloys*, February, p. 236.

Hand Cleaners. Describes soaps and other materials for washing hands of mechanics or other industrial workers. *Soap*, February, p. 21.

Hexanes. "P-V-T Relations and Derived Quantities for Hexanes." *Industrial and Engineering Chemistry*, February, p. 161.

Hydrocarbons. "Oxidation Characteristics of Pure Hydrocarbons." *Industrial and Engineering Chemistry*, February, p. 183.

Japanese Chemical Industry. "An American's Appraisal of Japanese Chemical Industry." Brief Sketch. *Chemical & Metallurgical Engineering*, February, p. 118.

Lime. "Lime Experimentation." First of a series of articles on research experiments in the manufacture of lime. *Rock Products*, February, p. 72.

Lithium Chloride. "Lithium Chloride from Lepidolite." *Industrial and Engineering Chemistry*, February, p. 209.

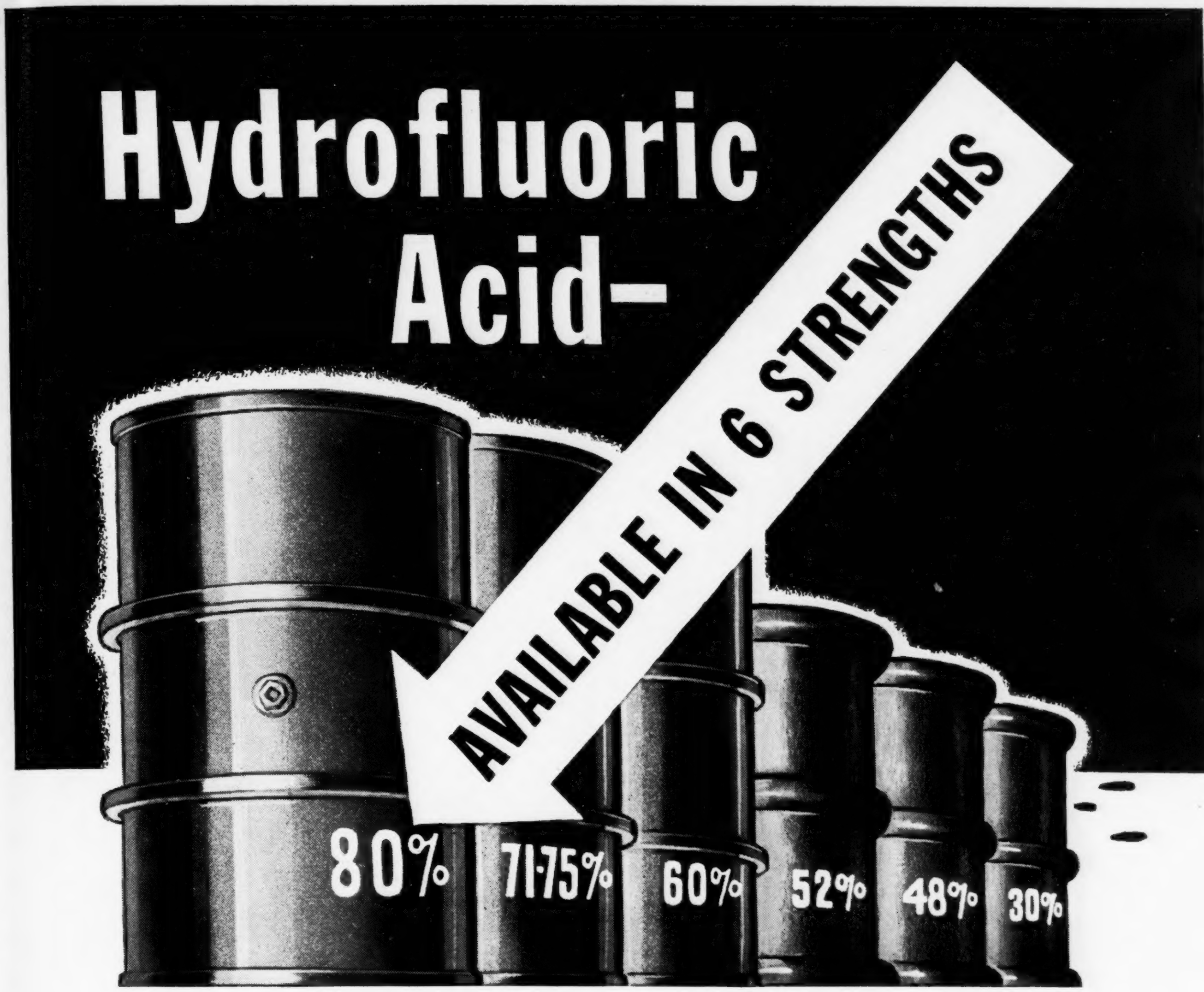
Metallurgical Analysis. "Colorimetry in Metallurgical Analysis." Describes method for determining manganese and chromium in iron and steel using the spectrophotometer. *Metals and Alloys*, February, p. 245.

Pigments. "Effect of Reinforcing Pigments on Rubber Hydrocarbon." *Industrial and Engineering Chemistry*, February, p. 218.

Pressure Regulators. "Simple Pressure Regulators, Principal Types and Their Characteristics." *Instruments*, February, p. 44.

Research. "Industrial Research in Foreign Countries during 1941." *Chemical and Engineering News*, Jan. 25, p. 77.

Rosin. "Rosin—Its Possible Use in the Present Emergency as a Partial Replacement for Coconut Oil." *Soap*, February, p. 29.



FOR etching and frosting electric light bulbs and other glass products, for cleaning stainless steels, as an aid in straw bleaching processes, and for many other industrial purposes, hydrofluoric acid possesses many advantages.

Particularly valuable to the industrial user is the high grade, iron-free hydrofluoric acid made by Pennsylvania Salt Manufacturing Company, who purchased the facilities of Sterling Products Company, Easton, Pa., some time ago.

Meeting the most exacting requirements, this hydrofluoric acid is available in five strengths for domestic users —30%, 48%, 52%, 60% and 80%. Also, for export, there is supplied 71-75% acid. Shipment of hydrofluoric acid is in rubber drums for strengths under 60%. Stronger grades of the acid are packed in steel containers.

For complete information applicable to your problems, write to Pennsylvania Salt Manufacturing Co., Widener Bldg., Philadelphia, Pa.

PENNSYLVANIA SALT MANUFACTURING COMPANY
Chemicals

REG. U.S. PAT. OFF.

1000 WIDENER BUILDING, PHILADELPHIA
New York • Chicago • St. Louis • Pittsburgh • Wyandotte • Tacoma

FOR DEFENSE BUY UNITED STATES SAVINGS BONDS AND STAMPS

Here and There With The Chemical Industry

(1) Donald M. Nelson, Chairman of the War Production Board, addressing the Conversion Conference of Business Paper Editors and Publishers with War Production Board officials in Washington, Feb. 13. (OEM Photo.) (2) Group who attended recent demonstration of safe handling of liquid chlorine at William Marzahl Co., S. Kearny, N. J. (3) Left to right, at the liquid chlorine demonstration, Harry K. Davies; Willard Jacobs, Niagara Alkali; and Fred Marzahl, William Marzahl Co. (4 and 5) "Three Big Men from the Press Are We, Pert as . . . can be," etc., etc. Howe (I. & E. C.), Kirkpatrick ("Chem & Met"), and Murphy (Chemical Industries) with true Gilbert and Sullivan gusto entertain in a rather unusual way the recent joint meeting of the N. Y. Section, A.I.Ch.E. and the Junior Chemical Engineers. Directly below, Francis B. White (Foster-Wheeler) president of the J.C.E. who acted as "maestro."

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Plaskon Company Opens New Research And Engineering Building in Toledo

Research and engineering building of the Plaskon Co. was formally dedicated in Toledo Feb. 27, in the presence of 165 leaders of the industry. The laboratory, which is under the direction of Dr. A. M. Howald, sets several new standards.

Dr. E. R. Weidlein, Director of Mellon Institute, made the principal opening address, stressing the fact that laboratories hold the answer to the intricate production problems of the post-war period. He also pleaded that selective service not draw too many technologists out of the laboratories. James L. Rodgers, president of Plaskon, formally dedicated the building.

Ronald Kinnear, president of the Society of the Plastics Industry, which held its directors' meeting that day in Toledo, brought the greetings of the industry. H. D. Bennett, President of the Toledo Scale Co., which originated Plaskon, also spoke.

Top photo shows the new building. Below that, left, W. N. Shepard, advertising manager of Plaskon. Below him, James L. Rodgers, president of Plaskon, making the formal dedication. Below that, Ronald Kinnear, president of the Society of the Plastics Industry, bringing greetings. Bottom photo, left, Dr. A. M. Howald, director of research, and Dr. E. R. Weidlein, director of Mellon Institute. Directly below, a portion of the new laboratory.

1

What's New in the Chemical Industry

(1) Dr. R. E. Burk (left) director of Standard Oil Co. of Ohio's new research laboratory in Cleveland, is shown here with a model of the long heptane molecule found in gasoline which has been transformed into a ringfrom to make toluene. (2) Transparent Tenite tubing made by Extruded Plastics, Inc., Norwalk, Conn., from a cellulose acetate butyrate formula of Tennessee Eastman. It is available in sizes from 3/16″ to 3/4″. (3) Shortage of materials has led to problems in replacing worn out sash. Second story windows of this factory have been fitted with panels of Insulux blocks made by Insulux Division, Owens-Illinois Glass. (4) Resistoflex Corp., Belleville, N. J., is fast at work turning out many items made of Resistoflex, similar to these industrial gloves. These gloves protect workers handling oils, organic solvents and other skin irritants. Industrial aprons also are made of the substance as well as tubing, mechanical molded parts, etc. (5) New "Roll of Honor" plaque designed by Pittsburgh Plate Glass Co. is made of polished black Carrara glass on which emblem is sand-carved and painted with gold leaf.

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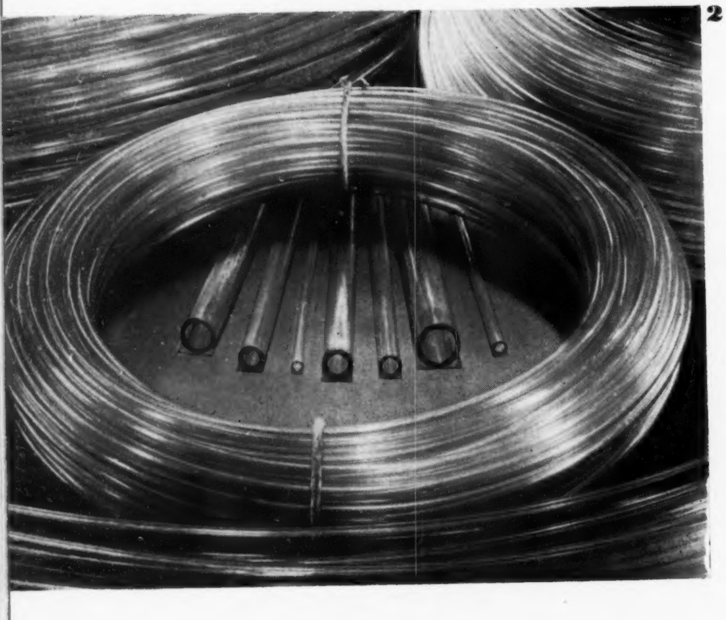

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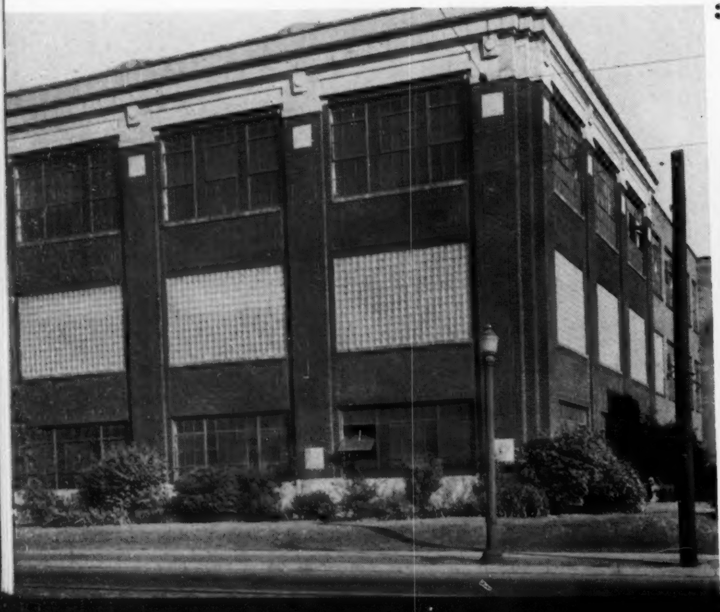

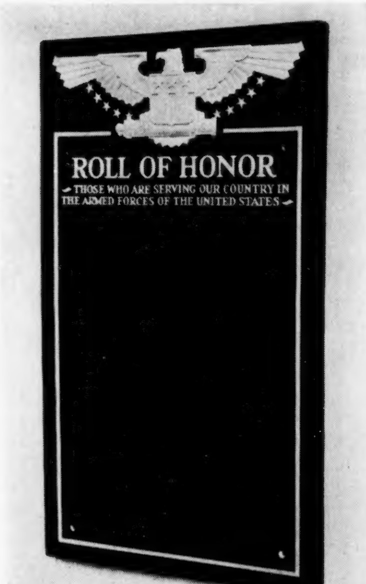

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NEWS OF THE MONTH

GOVERNMENT

New Manganese Program

THE government has begun a colossal manganese program—something akin to the proposed expansion program of mineral and power developments in the U. S. laid before the Senate last month by Secretary of the Interior, Harold L. Ickes—which will produce well over 600,000 tons of high grade manganese concentrates per year. The program, which calls for construction of 10 new, government-financed plants in various sections of the U. S. was announced this month by William L. Batt, director of materials for the War Production Board.

Under the proposed Ickes expansion program—further details of which will soon be released—low-grade domestic ores would be used to help make the U. S. independent of foreign minerals during the emergency, millions of tons of shipping would be saved and also a rounded development of the West would take place. His program also includes sample power projects out of many possible developments in the West.

Intensive studies and experiments carried on during the past year by the United States Bureau of Mines and Geological Survey and by private groups have developed methods that will produce high grade manganese concentrates from 10 to 12 per cent ores. Results of the various tests have been evaluated by the advisory committee of the National Academy of Sciences and several have been recommended to the W. P. B. for development, said Mr. Batt.

These will be applied on three of the ten projects and from which more than two-thirds of the expanded domestic manganese output will come. These three large projects are to be located in the Cuyuna Range of Minnesota, the Missouri River area in South Dakota and in the vicinity of Boulder Dam in Nevada.

The Cuyuna Range, largest of the three projects, has presented the most difficult extraction problem. The method finally adopted is a sulfuric and sulfurous acid bleach, by which manganese sulfate is formed, then kiln-treated to produce 60 per cent magnanese oxide concentrate.

More than a million tons of ore a year will be treated at a Government-built plant to be erected in the area. Ore for the operation will be purchased from private producers.

In the South Dakota area 16 per cent manganese concentrate will be extracted from 1 and 2 per cent manganiferous shales. Ore dressing followed by a blast furnace smelting process will be used to extract the metal from some five million tons of clay annually.

The U. S. never has been more than a negligible producer of manganese because deposits in this country are low grade and present difficult engineering and technical problems in their recovery. This has made them far more costly than high grade deposits in Africa, India, and Russia, from which the bulk of the United States supplies has come.

The manganese program, Mr. Batt pointed out, is one of insurance rather than immediate and pressing necessity. In addition to the reserve supply now in this country, shipments still are being received from abroad and considerable quantities are coming from South America.

P-89 Order Changed

Changes have been announced in the Preference Rating Order P-89 covering maintenance, repair, and operating supplies for the chemical industry, to redefine the term "operating supplies" to restrict the former broad range of the order.

As re-defined, the term means any material essential to operation of the producer's plant, including, but not limited solely to; lubricants, fuels, catalysts, and small perishable tools. Specifically excluded are materials physically incorporated or chemically, into the producer's products, and materials other than catalysts, entering into the chemical reaction necessary to manufacture of such products. Washes, solvents, extractions, etc., also are excluded.

Ratings under P-89 are supposed to be given only firms having specific authorization, with a serial number. Up to the present, no company has received permission to operate under this order, because applications to date indicate, according to the WPB, that as issued, the order was too broad in its coverage. However, it is expected that serial numbers will be issued shortly, under the amended order, to permit companies engaged in producing war chemicals to take advantage of its provisions. It also was amended to allow Canadian firms to use it when specifically authorized, in line with a recently announced policy of WPB.

Metallurgists Wanted

The Civil Service Commission is seeking metallurgists for work in Government navy yards, arsenals, and other war agencies. The positions pay from $2,000 to $5,600 a year and will last in most cases for the duration of the war. Sending application forms, obtainable in any first- or second-class post office, to the Commission in Washington, D. C., is all that is necessary to be considered for these positions. For detailed information, see Civil Service Commission's announcement No. 210 in any first- or second-class post office, or write to the Commission in Washington, D. C.

Explosive Licenses Up

The Explosives Control Division of the Bureau of Mines has announced that general emergency permits now in effect for all persons or corporations manufacturing, distributing, storing, using or possessing non-military explosives or their ingredients will be valid until the "close of business" March 16, 1942, but after that date new Federal licenses will be required.

Previously, the expiration date for the emergency permits had been set for March 1, 1942, but Dr. R. R. Sayers, Director of the Bureau, stated that the additional time was granted so the Division could complete its task of appointing licensing agents in each of the 3,070 counties in the Nation.

Dr. Sayers also was informed by C. E. Nighman, Chief of the Explosives Control Division of the Bureau, that many persons and corporations have not had an opportunity to submit their requests for permits to the licensing agents.

In the territorial and island possessions the effective date of the emergency permits has been extended to April 1.

COMPANIES

Sulfur Stocks High

According to the Bureau of Mines, production of crude sulfur in the United States in 1941 attained a new record of 3,139,253 long tons, a 15% gain over 1940. Mine shipments increased about one-third and were the largest on record—3,401,410 long tons, compared with 2,558,742 tons in 1940.

With reference to the operations of the Texas Gulf Sulphur Co. during 1941, Walter H. Aldridge, President, in his Annual Report says:

"Notwithstanding shipments of more than 2,000,000 tons of sulfur during 1941,

the largest in the history of the Company, the stocks of sulfur above ground at the mines today are at virtually the same tonnage as a year ago. Total stocks of the company at all points, including the mines, remain in excess of 3,000,000 tons, and exceed by about 5% the corresponding figure at the beginning of 1941. The Texas Gulf Sulphur Co. is prepared to produce sulfur at a materially higher rate than that of 1941, if the demand should make such an increase necessary."

New Girborol Plant

Girdler Corp. of Louisville, Ky., is proceeding with the design and erection of a Girborol plant to purify and dehydrate 25 million cubic feet per day of condensate-separator gas from the McKamie, Ark., field for the McKamie Gas Cleaning Co. of Arkansas. A gasoline recovery plant will be erected along with the purification plant and later it is planned to add another plant to convert the recovered hydrogen sulfide to elemental sulfur, sulfuric acid or some other useful product.

Michigan Chemical Builds

The Michigan Chemical Corporation is completing construction of a boiler plant and has already begun construction on an additional manufacturing unit.

The new boiler plant will give the plant four times as much steam producing capacity as at present.

The additional manufacturing unit will proceed as rapidly as possible.

The corporation's technical staff also has been increased. Sam Robinson, of Brunswick, Georgia, formerly in the paper industry, has been added to the staff of chemists.

Quaker Gives Bonus

Quaker Chemical Products Corporation, Conshohocken, Pa., has distributed a portion of 1941 earnings to all office, factory and laboratory employees. Each employee received his or her share of the profits in the form of a bonus, which was based upon present salary, years of service, and the value of the individual to the corporation.

Pomona Buys Westco

Pomona Pump Co., manufacturer of vertical pumps, has purchased the Westco Pump Division of Micro-Westco, Inc., Bettendorf, Ia. Newly acquired business will be operated as Pomona Pump Co., Westco Division, at 2621 Locust Street, St. Louis, Mo.

She's Sharing Her Car to Save Tires

To conserve tires and tubes and reduce wear and tear on automobiles, employes in the 14 plants and 10 branch offices of Monsanto Chemical Co. are pooling their transportation facilities and where cars formerly carried one or two persons to and from work, exchanges are being made so cars will carry capacity passenger loads. Frances Belz, stenographer in the company's export department at St. Louis, is shown putting a "Monsanto Share-Your-Car-Club" sticker on the windshield of her car.

Standard Toluene Plant

The Standard Oil Co. of Indiana has concluded a contract with the government to build and operate in the Midwest, a toluene plant capable of producing as much as the entire nation's annual output during the first World War.

New Synthetics Company

A new company, Petroleum Chemicals, Inc., has been formed by Continental Oil Co., Air Reduction Co. and the latter's affiliated organization, U. S. Industrial Alcohol Co. to develop the production of synthetic organic chemicals from petroleum.

Moves to Wilmington

Executive and sales offices of the Photo Products Department of E. I. du Pont de Nemours & Co., were moved from their present location, 9 Rockefeller Plaza, New York, N. Y., to Wilmington, Del., March 1.

Changes Name

After 48 years, International Filter Co., Chicago, a pioneer in the field of water conditioning and allied equipment, has changed its name to "INFILCO Incorporated."

To Consider Merger

Special meetings of the stockholders of the International Minerals and Chemical Corp. and the Union Potash and Chemical Co., in which latter company International has a substantial interest, have been called for March 30, to approve a merger of the two companies.

Zinc in "Priorities"

What zinc means to the army is told in the form of a colloquy in the March number of *Priorities*, house magazine of Prior Chemical Corp.

New Company

National Chemical Corp. has been formed in Augusta, Me., for the manufacture, distribution and sale of chemical fire fighting material and products.

GENERAL

Urges Cotton Research

Cotton, formed into sheets and bonded with plastics made from corn cobs, was suggested as a substitute food container for tin cans in an address on Feb. 4 before the student body of the College of William and Mary at Williamsburg, Va., by Colonel Maurice E. Barker, Chief of the Technical Division in the Office of the Chief, Army Chemical Warfare Service.

"Chemists, men and women, must begin an immediate, intense and continual search for packaging materials made from plentiful domestic materials," said Colonel Barker. "Why not make such containers from cotton and corn cobs? It can be done."

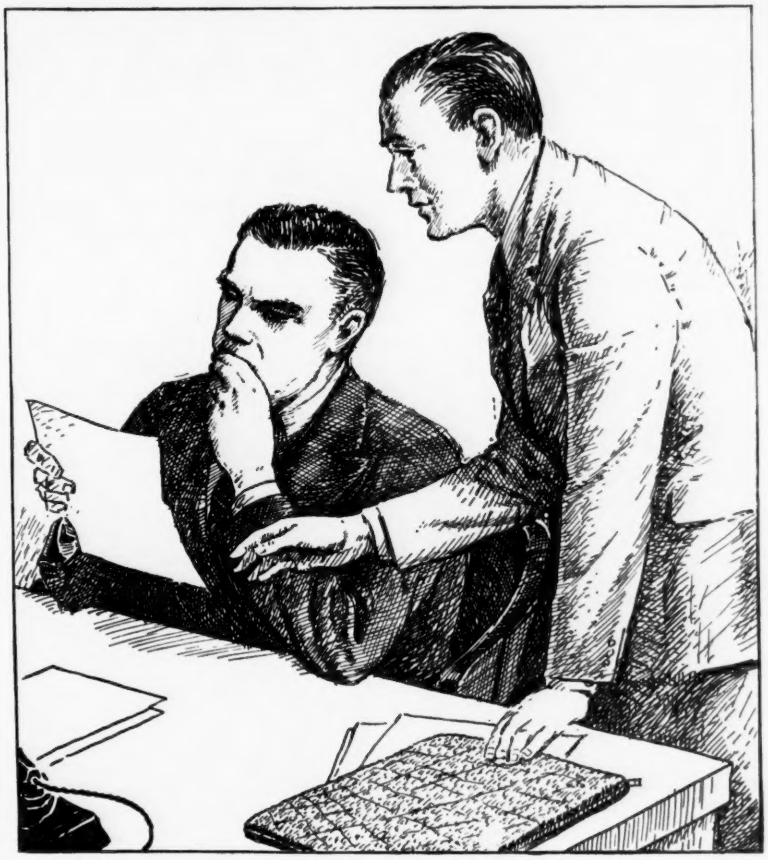
To replace the scarcity of corrosion resistant metals for chemical plant equip-

An activated aid to processing **DARCO** REG. U.S. PAT. OFF. An active aid for purity specifications

COOPERATION

is stronger than ever these days . . .

It can lick almost any problem!



The best way to solve any problem of materials is for user and supplier to tackle the task together.

Today, under a war economy, new manufacturing processes are being developed, under pressure, and production must follow as soon as possible. When activated carbon treatment is part of the process, precious time can be saved by calling in our technical representative.

In the purification field, cooperation between your staff and the Darco staff has two distinct advantages. (1) It helps solve your own purification problems, both for current production and for new developments you may be planning. (2) It helps balance the available supplies of activated carbon with industry's needs.

If you are considering the use of activated carbon for improving product purity, for reducing production costs, or both—the first step is to get in touch with Darco now. Cooperation today may save headaches tomorrow.

Let us cooperate with you in development work. It takes time to meet specific demands.

DARCO Reg. U. S. Pat. Off.

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60 East 42nd Street, New York, N.Y.

ment, Colonel Barker suggested the "loan" of gold and silver from our vaults to provide linings of reaction kettles and stills.

Further challenging the American chemist for materials essential to the victory of this country in the present war, Colonel Barker cited the vast quantities of clay in this country as a source of aluminum.

Pointing out that there are not enough sheep in this country to furnish all the wool we need, Colonel Barker suggested the possibility of processing cotton in some manner to take its place.

Brothers Get Chandler Award

For outstanding achievements in chemical science, two brothers, Dr. Robert R. Williams, chemical director of the Bell Telephone Laboratories, New York, and Dr. Roger J. Williams of the University of Texas, last month received awards of the Charles Frederick Chandler Medal of Columbia University. This is the first double award of the medal since it was established in 1910.

Dr. Robert R. Williams was cited for "his years of work on the isolation of vitamin B_1 and his contributions to the elucidation of its chemical structure." Vitamin B_1, which Dr. Williams synthesized and named thiamin, is the antineuritic beriberi vitamin, vital to nerve health and life.

The award to Professor Roger J. Williams was made in recognition of his discovery of pantothenic acid, powerful regulator of growth popularly known as "the acid of life," and for his contributions to the knowledge of the vitamin B complex.

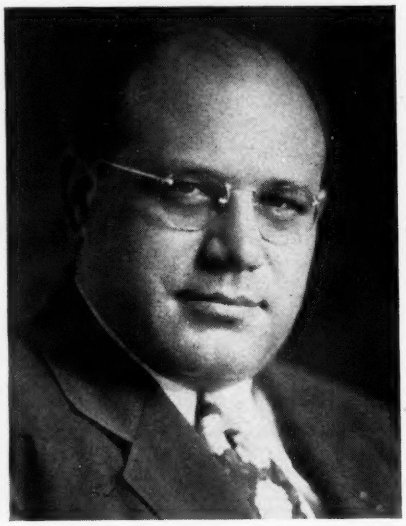
St. Louis Group Meets

Associated Drug & Chemical Industries of Missouri's February meeting at the University Club in St. Louis was addressed by Smoke Commissioner Raymond R. Tucker whose work in reducing smoke volume in St. Louis has attracted nationwide attention.

Exposition Space in Demand

"The most important industrial exposition of the year on account of the war," according to the way plans are shaping up will be the second National Chemical Exposition sponsored by the Chicago Section of the American Chemical Society, Nov. 17 to 22 at the Stevens Hotel in Chicago. More than 60 per cent of the available exhibition space, double the area of the first show held in December, 1940, is already under contract with leading firms throughout the country. It is anticipated that all of the space will be disposed of at an early date.

Establishes Fellowship



A research fellowship in paint technology, to be known as the Joseph J. Mattiello Fellowship, has been established in the Department of Chemistry at the Brooklyn Polytechnic Institute.

Funds to maintain the fellowship will be provided by royalties accruing from sales of the first volume of a study of Protective and Decorative Coatings, prepared by a staff of chemical specialists under the editorship of Dr. Mattiello. Published last Fall, the first of three or possibly four volumes, which ultimately will comprise the complete study, is an 800 page treatise on the materials and processes of the paint and varnish industry, to which more than thirty collaborators, constituting a veritable Who's Who in industrial chemistry, have contributed. All of these have waived their royalties to support the fellowship.

To Address Chemists' Club

Floyd S. Chalmers, editor of the Financial Post of Canada*, and recently returned from a two months' stay in England, will speak before the Symposiarchs at the Chemists' Club (N. Y.) at a dinner meeting, Thursday, March 26.*

ASSOCIATIONS

Midwest Power Conference

Next annual meeting of the Midwest Power Conference will be held on April 9-10 at the Palmer House, Chicago. This conference is sponsored by the Illinois Institute of Technology with the cooperation of the nine other mid-western universities and colleges and the local sections of the Founder and other engineering societies.

Taylor Gets Longstaff Medal

The Longstaff Medal of the Chemical Society of London has been awarded to Dr. Hugh S. Taylor, chairman of the Department of Chemistry at Princeton University.

The medal is conferred every three years upon a fellow of the society "who, in the opinion of the council, has done the most to promote the science of chemistry by research." It is the highest honor that the council of the society can bestow on a fellow.

No Petroleum Meeting

Twelfth Mid-Year Meeting of the American Petroleum Institute, scheduled for May 25-28 at Oklahoma City, Okla., will not be held, W. R. Boyd, Jr., API president, has announced. Extreme demands of the war upon the vital petroleum industry, which is supplying explosives, synthetic rubber, glycerine, ethyl alcohol, and many other synthetic raw materials made from crude oil, as well as unprecedented quantities of its normal products, and the solution of an ever-increasing transportation problem, are keeping members of the Institute and of its working committees so actively engaged that the Institute's executive committee, upon recommendation of President Boyd, decided to cancel the meeting.

Review Courses at Detroit

The Detroit Section of The American Chemical Society has begun, under the direction of Dr. R. S. Shane, four intensive review courses for practicing chemists. Inorganic, Organic, Physical, and Biological Chemistry are being offered. Lectures began March 2.

The courses run for ten weeks and consist of twenty lecture hours. No tuition is charged and no academic credit is given. Instruction is by competent men from the staffs of the University of Detroit and Wayne University.

S. C. I. Meets

A meeting of the American Section of the Society of Chemical Industry was held

MacInnes Gets William H. Nichols Medal

The William H. Nichols medal of the N. Y. Section, American Chemical Society, was presented March 6 to Dr. Duncan A. MacInnes (left), Rockefeller Institute of Medical Research, at a dinner of the section in the Hotel Pennsylvania, N. Y. City. The award, highest honor of the N. Y. Section, was bestowed upon Dr. MacInnes by Professor William C. MacTavish, New York University, "for distinguished contributions to electrochemistry." Acceptance address was on "Galvanic Cells as Instruments of Research."

Feb. 21 at The Chemists' Club, N. Y. City.

The subject "What is Research?" was discussed from several angles by the chairman, Dr. Lincoln T. Work, John P. Hubbell, Singmaster & Breyer, Dr. George O. Curne, Vice-president of Carbide & Carbon Chemicals Corporation and Dr. L. W. Bass, assistant director.

Officers Re-nominated

The Chemists' Club, N. Y. City, this month re-nominated its officers to serve another year. Up for re-election are: Walter S. Landis, vice-president of American Cyanamid, president; Ralph E. Dorland, Dow, resident vice-president; Jasper E. Crane, Du Pont, non-resident vice-president; William J. Orchard, Wallace & Tiernan, suburban vice-president; Robert T. Baldwin, secretary; and Ira Vandewater, R. W. Greeff, treasurer.

Charles L. Gabriel, Commercial Solvents and James G. Detwiler, Texas Co., have been nominated to serve as trustees for three years.

PERSONNEL

Re-elect Officers

At its recent annual meeting, Strohmeyer & Arpe Co., N. Y. City, importers of olive oil, food products and commercial waxes, re-elected Arthur H. Hoffman, president and treasurer; Walter A. Benz, vice-president and secretary; and Alfred F. Drucklieb, assistant secretary. All of the officers have been with the company for more than 25 years.

Hubert With Laucks

Dr. Ernest E. Hubert, since 1935 research pathologist for the Western Pine Association, Portland, Ore., has been appointed to the research staff of I. F. Laucks, Inc., manufacturing chemists, Seattle. He will assume his new duties March 16, at the Seattle headquarters of the company where he will work in a new laboratory confined to problems of wood preservation and wood utilization.

Breen in OPA

J. Frederick G. Breen has been made Chief of the Chemical Section of the New York Regional Office, O. P. A. Mr. Breen was formerly vice-president and sales manager of Smith, Kline and French, Inc., Philadelphia, Pa. His assistant is **Frederick R. Haigh,** formerly an Eastern District Manager of the J. R. Watkins Co., Winona, Minn.

Valley Promoted

Adolph Valley has recently been appointed Manager of the Cleveland Office of Innis, Speiden & Co., taking the place of **D. S. Cushman,** who has been transferred to New York as Assistant Manager of Sales.

Reid Chief of Chemicals Branch

Dr. Ernest W. Reid, Pittsburgh, Pa., was made Chief of the Chemicals Branch, War Production Board, last month.

Dr. Reid has been Assistant Chief of the Branch since its organization. He replaces **Dr. Edward W. Weidlein,** also of Pittsburgh, who will be retained in the organization as senior consultant.

One Retirement and Two Promotions at Du Pont

E. W. Furst

E. C. Thompson

C. W. Davis

Edward W. Furst, general manager of the Grasselli Chemicals Department of E. I. du Pont de Nemours & Co., will retire April 1st, completing 49 years of service. **Emmet C. Thompson,** present assistant general manager, will succeed to the general managership. **Clark W. Davis** will become assistant general manager.

Mr. Furst, long importantly connected with the progress of the chemical world, joined Grasselli in his native city of Cleveland in 1893, serving his first two years with the Statistical Department. Later he became secretary of the company's Manufacturing Committee, and subsequently head of the Ore and Zinc Department.

He was a vice-president, member of the Executive Committee and Board of Directors of the Grasselli company when it was acquired by Du Pont in 1928. In January, 1936, he was elected president of the company and shortly thereafter received the appointment as department general manager upon the company's reorganization as a Du Pont manufacturing unit.

Mr. Thompson became assistant director of the Du Pont Company's Miscellaneous Manufacturing Department in 1919, and later was made manager of the Pigment & Heavy Chemicals Division of Du Pont's Paint, Lacquer & Chemical Department.

In 1928, he was elected a vice-president of the Grasselli Chemical Company, residing in Cleveland. He returned to Wilmington as assistant general manager upon formation of the Grasselli Department.

Clark W. Davis has been manager of the Military Explosives Division of the Du Pont Company. From 1936 to 1939, he was assistant director of the Manufacturing Division of the Explosives Department and was formerly branch office sales manager in Pittsburgh.

More Personnel

First Lt. R. E. Meints, for the past four years with National Aniline & Chemical Co., Buffalo, N. Y., has been called to active duty with the Chemical Warfare Service and is assigned temporarily to Edgewood Arsenal. Duty at Huntsville, Ala., will follow.

R. H. Giebel, vice-president of Harshaw Chemical Co., and **Werner G. Smith,** president of the Company bearing his name, have been made members of the soap and glycerin industry's advisory committee of the War Production Board.

Dr. Marston T. Bogert, in addition to his regular university duties as Emeritus Professor of Organic Chemistry in Residence at Columbia University has become connected with Ralph L. Evans Associates. He will aid them in studying the many chemical problems constantly arising in the progress and development of their business and research, particularly those due to the present emergency.

Douglas W. Coutlee of Merck & Co., Inc., manufacturing chemists, has been appointed chairman of the direct mail committee of the Association of National Advertisers.

Gerald E. Donovan has been elected vice president and director of the Schering Corporation of Bloomfield. N. J. and will be in charge of financial operations.

Jerome L. Boyer has been appointed Director of Technical Sales of Newport Industries, Inc., succeeding **E. V. Romaine.**

Edwin H. Brown has been elected a vice president of the Allis-Chalmers Manufacturing Co., in charge of engineering and development.

Nicholas L. Kalman, formerly with Arthur D. Little, Inc., has joined the staff of Ridbo Laboratories, Inc., Nutley, N. J., as Director of Organic Research.

Robert D. Williams has been named a research engineer on the technical staff of Battelle Memorial Institute, Columbus O., where he will assist in the Institute's welding research.

John S. Rovey, formerly of Ingram & Bell, Ltd., Montreal, Canada, has become associated with Arthur S. LaPine & Co., Chicago.

George A. Fowles has been appointed a sales engineer in the synthetic sales division of the B. F. Goodrich Co., with cable and wire insulation problems as his special field.

Francis B. Hillhouse has been appointed to the Chemicals Staff of the Bureau of Foreign and Domestic Commerce. He will be associated with **J. N. Taylor** in the Organic Chemical Section and will serve under **C. C. Concannon,** Chief of the Chemicals Staff and Industrial Consultant on Chemicals.

At the annual meeting of the stockholders of Rumford Chemical Works, Rumford, R. I., the Board of Directors was re-elected. **A. E. Marshall,** president, was elected to the additional post of Chairman of the Board. Two of the

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Packaging and Container Forum

(*Continued from page 356*)
second method is to lay a tier of sacks flat on two parallel timbers or peeled logs. Each tier is laid at right angles to the previous tier.

Textile Bag Ceiling

Maximum prices for second-hand cloth bags are revised to conform to the provisions of the Emergency Price Control Act of 1942 in an amendment issued Feb. 4th to Price Schedule No. 55 by Leon Henderson, Administrator of the Office of Price Administration.

The amendment provides that beginning on February 16, 1942, second-hand bags may not be sold at prices above the highest prices received by a seller during the period October 1-October 15, 1941. The emergency ceiling, imposed on December 16 as result of profiteering that followed the outbreak of war, based maximum prices on the period November 15-December 6.

Since the October 1-October 15 prices were generally lower than those of November 15-December 6, OPA is delaying the effective date of the new ceiling until February 16 so that dealers and other sellers may dispose of any bags purchased at prices higher than those set in the new ceiling. However, the schedule provides that deliveries under contracts executed between February 3 and February 15, inclusive, must be completed by March 30, 1942. All new contracts made on and after February 16, of course, must comply with the new maximum prices.

Bags Re-defined

"Second-hand bags" are re-defined by the amendment so as to make it clear that bags made of jute, sisal, gunny cloth, or other textile material are covered, in addition to bags made of burlap or cotton.

As revised, the schedule also liberalizes the method of determining prices if a seller made no sales of a particular type of bag during the base pricing period. In this event, it is now stated, a seller may charge a price in line with that received during the base period for related or similar types of bags. Originally, a seller was required to use as a maximum price the "last sale" price of the same type of bag, even though no sales had been made for a considerable time previous. Only actual sales, contracts of sale, or deliveries can be used to determine maximum prices.

All persons who sold more than 1,000 second-hand bags during any month of 1941 are required to file with OPA on or before March 10, 1942, a list of all sales, contracts to sell, and deliveries made during the October 1-October 15, 1941, period, giving the date of sale, name and address of the purchaser, quantity of each type, size, weight, and grade of second-hand bags sold, together with the price received for each.

The amended schedule contains provisions for special applications by persons who made no sales or deliveries of any kind during the base period. OPA will advise them as to specific maximum prices for which they can sell. In addition, persons whose only transactions during the base period were deliveries made under contracts entered into before October 1, 1941, at prices below the market prices prevailing during the base period may make application for special consideration from the Office of Price Administration.

Used Drum Prices

Modifications of Price Schedule *No. 43*, covering used *steel barrels* and *drums*, were announced on Feb. 2nd in Amendment No. 2 to this schedule. This amendment became effective on that date.

One of the features of the amendment is limitation of the ceiling to three classifications of barrels and drums only. These are the 50 to 58 gallon capacity; the 29 to 33 gallon capacity; and the 14 to 16 gallon capacity. These three sizes include 98% of all steel barrels and drums in use. No other capacities than these are covered by the ceiling as amended.

The ceiling price for raw used drums has been extended to any purchaser, instead of only the user and reconditioner as before.

Definition of a reconditioned drum has been tightened to insure that complete reconditioning is necessary to obtain the price differentials granted in the schedule for reconditioned drums. These prices are:

14 to 16 gallons inclusive	$1.45
29 to 33 gallons inclusive	1.85
50 to 58 gallons inclusive	2.25

The original schedule granted a premium of 25 cents for reconditioned 50 to 55 gallon drums that had been lacquer-relined and baked. The amendment revises this so that any 50 to 58 gallon lined and reconditioned drum that is suitable for use as a food drum can command this premium. A lesser premium for the smaller sizes is also put into effect.

Another feature allows the purchaser a deduction from the delivered ceiling price of a raw used drum when and if he makes his own pickups from dealers. The original schedule set a flat delivered price ceiling with no allowances for pickups by buyers.

New Packaging Award

The establishment of a new annual packaging award for outstanding packaging achievement is announced by the American Management Association. Selection of packages for the calendar year 1941 has already been completed and will shortly be presented for consideration to the Jury of Award.

The award will be known as the American Management Association Packaging Award. Presentation of the trophy of award will be made at a luncheon during the week of the Packaging Exposition, sponsored by the American Management Association, to be held in the Hotel Astor, New York City, April 14 to 17.

The new award is the result of a thorough study conducted by a committee of the American Management Association to lay the basis for a scientific and professional determination of conspicuous accomplishment in the art of packaging. It represents an outgrowth of the Irwin D. Wolf Awards established by the association in 1931 and presented annually until 1941, when suspension was determined upon, pending the study by a committee to determine a more effective basis for the awards.

Jury Will Decide

Selection of packages for consideration by the Jury of Award has been made by "package detectors," represented in the persons of outstanding packaging men located in various geographical areas. To these "package detectors," the widest latitude, within prescribed criteria of packaging excellence, was permitted in their selection of packages.

All packages selected by the "package detectors" will be judged on the basis of ten characteristics: display visibility, buying information, consumer convenience, use of color, use of typography or lettering, beauty of design, merchandising ingenuity, construction ingenuity, production economy, use of materials. Different weights will be assigned to each of these characteristics.

To the package selected by the Jury of Award as most outstanding, there will be awarded the "Irwin D. Wolf Trophy." This trophy is offered by Irwin D. Wolf, vice president of the Kaufmann Department Stores, Pittsburgh, and a director of the American Management Association. In addition, it is anticipated that the Jury of Award will select other outstanding packages for honorable mention. Awards in all cases will be made to the company using the package for the distribution of its products.

In order to avoid the possibility of any attempt to influence the Jury of Award, the American Management Association will defer announcement of names of the "package detectors" and the personnel of the Award Jury until completion of the work.

 Prepared Monthly by U. S. Industrial Chemicals, Inc.

U.S.I. CHEMICAL NEWS

March ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1942

Wider Markets for Finishes Opened by Luminescent Types

Blackouts, Fluorescent Lamps Offer New Sales Possibilities

Whole new fields of applications for surface coatings have been opened by the rapid growth in the use of luminescent finishes. This term includes two types: fluorescent coatings, which glow only when activated by ultra-violet rays; and phosphorescent coatings, which glow after having been previously activated by natural or artificial visible light.

First substantial impetus in the commercial development of luminescent coatings was provided by the introduction of fluorescent lighting. Lamps of this type have steadily grown in popularity since they were placed on the market, and last year's sales are reported to have tripled 1940 figures. More recently, luminescent coatings have attracted wide interest as an aid to visibility during blackouts or temporary interruption of power supplies. Suggested applications include directional markers, curbs, bomb shelters, and similar uses.

Formulation of Coatings

While special care is generally required in the formulation of luminescent coatings, fundamentally they differ from ordinary finishes only in the type of pigment employed.

Certain chemical compounds have inherent luminescent properties in their pure state: for example, tungstates and molybdates. The pigments more commonly used in luminescent coatings, however, consist of substances which are naturally non-luminescent, but which are activated by the presence of traces of impurities. Sulfides and silicates are among the compounds which display this effect when activated by the presence of manganese or other substances.

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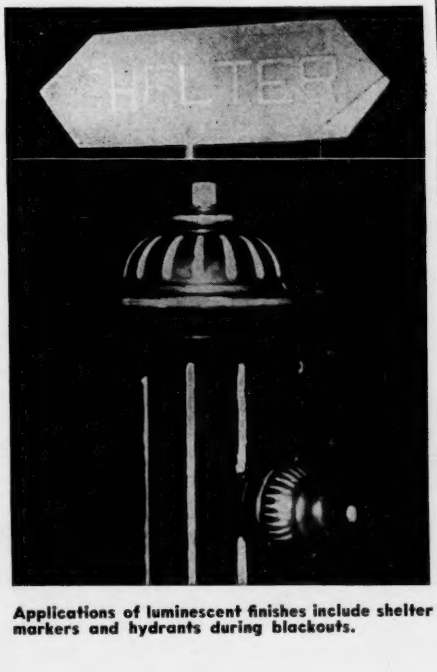

Applications of luminescent finishes include shelter markers and hydrants during blackouts.

Broad Potential Utility Seen For New U.S.I. Intermediate

Reactions of Ethyl Benzoylacetate Suggest Applications in Manufacture of Dyes and Synthesis of Many Chemical Compounds

A number of interesting fields for investigation in organic synthesis are opened by the reactions of ethyl benzoylacetate, a new chemical compound recently added to U.S.I.'s product list. In general, ethyl benzoylacetate may be regarded as analogous to ethyl acetoacetate, and its principal use up to the present has been in the manufacture of dyes of the pyrazolone group. The pyrazolone dyestuffs, because of their fastness to light and excellent washing characteristics, are used in piece goods, yarns, hat bodies, machine dyeing, and in wool printing such as delaines, rugs, and carpet yarns. Literature also mentions using these dyestuffs for silks (including acetates). Consideration of the reactions of ethyl benzoylacetate indicates that it has a wide range of potential utility.

Method of Manufacture

Ethyl benzoylacetate is a light yellow liquid, with a specific gravity at 20°/20° C. of 1.111 to 1.117. It is prepared by allowing ethyl acetate and ethyl benzoate, of high purity, to react with metallic sodium. As a result of this reaction, the sodium derivative is formed, from which ethyl benzoylacetate is liberated by the addition of dilute acid. The crude ester is then separated and purified by vacuum distillation.

Typical Reactions

Among the reactions of ethyl benzoylacetate which suggest fields for further investigation are the following:

1. With ammonia gas it forms an addition product; with aqueous ammonia there results an aminoamide which exists in two tautomeric forms:

$$C_6H_5.C(NH_2):CH.CO.NH_2 \leftrightarrows C_6H_5.C(:NH).CH_2CO.NH_2$$

   With simple amines it gives the corresponding substituted derivative, e.g., ethyl beta-methyl-imino-beta-phenylpropionate.
2. With hydrazine, it yields 3-phenyl-5-pyrazolone.
3. With phenylhydrazine it yields 1, 3-diphenyl-5-pyrazolone.
4. With hydroxylamine it yields 3-phenyl-5-isoxazolone.
5. With urea it yields 6-phenyl-uracil.
6. With guanidine it yields 2-imino-6-phenyl-uracil.
7. With nitrous acid, it forms an oxime, ethyl alpha-oximino-benzoylacetate.
8. With diazotized aniline, there results the alpha-phenylhydrazone of ethyl alpha, beta-dioxo - beta - phenylpropionate (ethyl benzoylglyoxylate), $C_6H_5CO.C(:NNHC_6H_5).COOC_2H_5$.
9. With ethyl orthoformate it yields ethyl beta-ethoxycinnamate.
10. With PCl_5, it yields beta-chlorocinnamic acid.
11. Iodine converts its sodium derivative into ethyl dibenzoylsuccinate.
12. Ethyl Chloroformate (Chlorcarbonate) on the sodium derivative gives ethyl benzoylmalonate and ethyl ortho-carbethoxy-beta-hydroxycinnamate.

(Continued on next page)

Ethanol Wins Favor in Duplicating Processes

CHICAGO, Ill.—Ethanol is gaining in favor as a solvent base in duplicating processes, it has been reported. In the solvent process, the material to be reproduced is typed on paper against an aniline dye carbon paper, forming a mirror-reverse imprint. This imprint is contacted with the copy sheets, which have been pre-moistened with a solvent.

Outstanding advantage of ethanol-base solvents, compared with some other types of duplicating fluid, is its non-toxic character. The high volatility desired in the duplicating process is obtained by using the ethanol in combination with relatively small amounts of other solvents.

That ethanol solvents can now be used in conjunction with electrically-operated duplicating machines, without danger of igniting the ethanol, is revealed in a recent patent. According to the inventor, the addition of mono-fluoro tri-chloro methane substantially reduces the flammability of the ethanol.

Describe Ether-Insoluble Lubricant for Stopcocks

ITHACA, N. Y.—An ether-insoluble lubricant for stopcocks can be prepared from starch and glycerol, it has been found here. The gel is prepared by suspending 9 grams of soluble starch in 22 grams of glycerol and heating to 140° C. After standing for a short time, the clear solution is decanted from the sediment and allowed to cool. The mixture is then allowed to stand overnight, when it takes on the consistency of a thick grease and can be employed as a lubricant.

The starch-glycerol gel is described as especially useful in extraction operations involving ether, and may be suitable for use with other nonpolar compounds.

Greater Fertilizer Demand Seen in Farm Output Boost

WASHINGTON, D. C.—Increased demand for fertilizers is predicted as a result of expected increases in agricultural output during the current year. Fertilizers containing potash, in particular, may be due for an upswing, since experiments recently conducted have shown the beneficial effects of potash additions on the growth of such staples as potatoes.

(U.S.I. produces potash products in two forms—I. C. Ash and Sulfate-Muriate—for sale to fertilizer manufacturers.)

March ★ **U.S.I. CHEMICAL NEWS** ★ 1942

Alcoholates Prepared by Sodium Hydride Reaction

NIAGARA FALLS, N. Y.—Sodium ethylate and other alcoholates can be prepared by the reaction of alcohols with sodium hydride, it has been revealed in a patent granted to an inventor here. The reaction in the case of preparing sodium ethylate is:

$$C_2H_5OH + NaH \longrightarrow C_2H_5ONa + H_2$$

This reaction, it is claimed, proceeds smoothly and rapidly, produces high yields, and overcomes many of the difficulties encountered in processes involving reactions with metallic sodium. A particular advantage in large-scale operations is that sodium hydroxide is finely divided as prepared, whereas metallic sodium must be subdivided for efficient results. Moreover, when metallic sodium is used, the metal may become coated with the alcoholate, which tends to inhibit further reaction. As a result, the alcoholate may be contaminated with metallic sodium, which is difficult to remove. When sodium hydroxide is used, the reaction is substantially complete, and the alcoholate is more easily recovered in the desired state of purity.

Luminescent Finishes

(Continued from previous page)

Vehicles for the luminescent pigments may be of a wide variety of types. In the manufacture of fluorescent lamps, nitrocellulose solutions are extensively used. These coatings naturally closely resemble conventional nitrocellulose lacquers, except for the pigment used. Organic solvents, such as butyl acetate, are commonly employed in formulation, and butyl phthalate is regarded as a good plasticizer for the system.

Other types of vehicles are based on resins. Methyl methacrylate resins, for example, may be used in solutions in butyl and amyl acetates. Damar and chlorinated rubber are also employed, with butyl phthalate as the plasticizer.

Pigment Standards Approved

The American Standards Association has approved 13 new standards for pigments, including 4 specifications and 9 methods of test. Particularly important among the specifications are those dealing with basic sulfate white lead and blue lead. Test methods include tendency of pigments to bleed and chemical analysis of a number of commonly used pigments.

Tells Convenient Method For Preparing Cyanates

A convenient means for preparing fresh sodium cyanate whenever needed—for example, for the transformation of an amine group into the ureido group—has been described by a reader of U.S.I. CHEMICAL NEWS.

Equimolecular quantities of urethan and sodium ethoxide are mixed together, the sodium ethoxide being in solution in absolute ethanol. When the mixture is boiled for a short time, the urethan goes into solution, and sodium cyanate is precipitated. The sodium cyanate is then washed with absolute ethanol and ethyl ether and dried.

The convenience with which fresh supplies of sodium cyanate can be prepared by this method is a special advantage, in view of the fact that sodium cyanate does not keep well on storage, because of its tendency to develop bicarbonate by hydrolysis.

Urethan, absolute ethanol, and ethyl ether are produced by U.S.I.

Ethyl Benzoylacetate

(Continued from previous page)

13. Ethyl Benzoylacetate is like Ethyl Acetoacetate in that the labile H's are replaceable with alkyl and acyl groups. Also, with hot dilute sulfuric acid it is decomposed, yielding acetophenone.
14. Condensed with resorcinol, it gives 7-hydroxy-4-phenylcoumarin (4-phenylumbelliferone), and with pyrogallol, 7, 8-dihydroxy-4-phenylcoumarin (4-phenyldaphnetin).

U.S.I. will gladly give additional information on the properties and applications of ethyl benzoylacetate.

Role of Chemistry is Portrayed in New Book

The place of chemistry in the world today is vividly portrayed in "This Chemical Age," by Williams Haynes. The book is of equal value to the highly skilled chemist and to those seeking an insight into the development of the chemical industry.

Among the topics covered are the research history and industrial development of rayon, cellophane, synthetic rubber, durable surface coatings, dyes, perfumes, and the sulfanilamides. In all cases, the chemical principles involved are clearly explained.

"This Chemical Age" is published by Alfred A. Knopf, Inc.

TECHNICAL DEVELOPMENTS

Further information on these items may be obtained by writing to U.S.I.

A phosphorescent fabric is supplied in rolls, and can be cut into strips to outline objects so that they can be seen in the dark, according to the manufacturer. Material consists of a woven-fabric backing and a phosphorescent coating on one side. **(No. 550)**

U S I

A new tracing cloth, suitable for both pencil and ink, is said to provide an unusually durable working surface. It will not show perspiration stains or water marks, and keeps pencil smudges and erasure scars at a minimum, it is claimed. **(No. 551)**

U S I

A new drum opener is said to operate on much the same principle as a can opener. Maker says that it is simple to use and that the opening action is rapid. Cutting unit is supported by steel uprights, and is counterbalanced for easy adjustment to the desired height. **(No. 552)**

U S I

A new thickener for suspensions of solids is described as resembling a filter press in construction. Operation depends not on settlement, but on removal of part of the liquid by filtration through a permeable filter membrane, while the solid suspension flows through a channel. **(No. 553)**

U S I

A new drying oil of the dehydrated castor type is said to have improved reactive properties as compared with previous oils of this type and to have high solvent power for resins. It is reported to produce a varnish with a fast dry and with good water resistance. **(No. 554)**

U S I

Synthetic para-cymene is now being produced from liquid terpenes, it has been announced. It is expected that the new product can be used in such applications as the manufacture of phenols, carvacrol, and thymol, sulfonated cymene as an emulsifier and textile assistant, and cumic, paratoluic, and terephthalic acids. **(No. 555)**

U S I

A low-visibility paint is described as useful in the protective concealment of structures. It is offered in seven shades. According to the maker, an unusual feature of the paint is the high heat-deflecting properties of the darker shades, permitting their use on storage tanks. **(No. 556)**

U S I

Filter-press plates are now being made from an acid-resisting material which has already been successfully employed in such applications as process plant piping, it is reported. Plates are available in a size suitable for 36-inch frame and plate units, can be machined to suit specific requirements. **(No. 557)**

U S I

A gray enamel is said to have demonstrated high protective powers on metal surfaces exposed to heat. According to the manufacturer, tests show that the enamel is not affected by temperatures up to 300° F. It is not intended for outside use. **(No. 558)**

U S I

A bellows-type pump seal consists of only two parts: a bellows with flanged ends formed from synthetic rubber, and a spring to hold contact facings against sealing washer and driving base. It is said that the seal is easy to install in difficult positions, and that it is suitable for contact with greases, oils, and alcohols. **(No. 559)**

New Purchasing Agent

M. E. Carlisle has been made general purchasing agent of the Pittsburgh Plate Glass Co., succeeding **J. A. Bechtel.**

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Directors, **Gardiner Fiske** and **Harold Willis,** are on active duty as Majors with the Army.

George H. Richards, formerly Secretary and Treasurer of Celluloid Corp., which was recently merged with Celanese Corp. of America, has become General Manager of Celanese Celluloid Corp.

A. M. Pitcher, formerly vice-president of Westvaco Chlorine Products Co., has joined the H. K. Ferguson Co., Cleveland and N. Y., as consulting chemical engineer . . . **C. E. Nighman,** international mining expert, has been appointed chief of the Explosives Control Division in charge of the administration of the Federal Explosives Act.

Dr. C. S. Wachtel is in charge of a new division of Corneliussen & Stackgold, Inc., N. Y. City, which is specializing in scientific equipment and medical supply.

A. M. Russell, who formerly operated the Russell Hale Chemical Co., Houston, Tex., is now associated with the Scientific Supply Co., Inc., of Texas.

Walter Geist, vice president of the Allis-Chalmers Co., is to head a new department, established to co-ordinate the company's sales policies.

Philip D. Reed, chairman of the board of directors of the General Electric Company, will head the Industrial Branches in the Division of Industry Operations of the War Production Board.

Captain John A. Riddick and **Lieutenant George E. Hines** of the Commercial Solvents Research Department recently reported for active duty with the Army.

George A. Benington of New Canaan, Conn., was elected a director of the American Water Works and Electric Co. Mr. Benington is vice president and a director of the Mutual Chemical Company of America.

OBITUARIES

Edward Ostrom

Edward Ostrom, long associated with the New York office of Hooker Electro-Chemical Co. died March 7. Services were held March 10 at the Fairchild Funeral Parlor, Brooklyn.

Alan G. Wikoff

Alan G. Wikoff, Editor-in-Chief of the General Publicity Department of Union Carbide and Carbon Corporation, New York, N. Y., died in White Plains, N. Y., Feb. 11 at the age of 46. His home was in Pleasantville, N. Y.

Carl Pfanstiehl

Carl Pfanstiehl, vice-president and director of research of the Pfanstiehl Chemical Company, of Waukegan, Ill., who conducted research for the government in the World War and the present war, died in St. Luke's Hospital, Chicago, March 1. He was fifty-three years old.

(*Continued from page 350*)
chemicals and materials directly entering into the war program or essential civilian channels.

Wood Containers. The chemical industry, always an important user of tight and slack cooperage barrels, has considerably increased its use of such containers during recent months, due to the growing scarcity of steel drums and the tight situation regarding paper bags. To facilitate the production of wood containers the O. P. M. issued Preference Rating Order P-79 on November 13, 1941, to manufacturers of all types of wooden barrels, kegs, and containers made from sawed lumber, veneer or plywood, and paperboard, for the procurement of iron and steel products needed in their manufacture. Under the order, A-5 preference ratings were made available for the procurement of steel hoops, nails, saws, knives, and other tools. A-8 ratings were assigned for deliveries of wire.

Tin and Terne Plate Cans

Tin and Terne Plate Cans. The War Production Board on February 11 issued conservation order M-81, placing sweeping restrictions over the use of tin plate and terne plate cans. Black iron can sheet was specifically exempted from terms of the order. No restrictions were placed upon the use of plated cans for specific food and fruit products. The order, in part, provides that manufacture, sale, and *use* of "special products" tin or terne plated cans be limited to 100 per cent of 1940 production and use, with certain specific requirements as to type and thickness of coating. Included under the "special products" classification were alcohol (except antifreeze), cements, rubber, liquid chemicals, fly sprays, acetone, amyl acetate, carbon bisulfide, triethanolamine, oleic acid, sodium silicate, dry cleaners, phenols, benzol, dyes, fire extinguishing fluids, mineral oil, nicotine sulfate, glycerol, turpentine, waxes, polishes, disinfectants, health supplies, paints, and accessories.

Use of "non-essential" cans (those not for food or for the products listed above) was ordered completely stopped by March 1 under the original terms of the order. Inasmuch as such drastic terms would work a severe hardship on the many industries involved, affecting producers of lubricating oil, dry chemicals, baking powder, certain pharmaceuticals, flavoring compounds, proprietaries, etc. who had large inventories of lithographed or embossed cans on hand, the order was modified to permit sale, delivery, and use until April 30 of cans which were completely manufactured before February 11, and to permit the assembly, distribution, and use of cans, all component parts of which were cut or lithographed before February 11.

Container Price Ceilings

Container Price Ceilings. Maximum price schedules have been established by the Office of Price Administration for used steel barrels and drums, burlap, second-hand bags and paperboard. In addition, agreements to insure price stabilization have been reached between O.P.A. and producers of kraft paper and slack barrel parts (wooden staves, hoops, and headings).

With reference to used drums, reconditioned containers of the 18 gauge, 55 gallon type had reached a price of at least $3.50 to $4.50 in eastern markets last fall, compared with the price of $2.72 each for new containers. The used drum price schedule, No. 43, became effective December 1, 1941, and specifically stipulated maximum allowable prices for such drums. Briefly, the schedule, with subsequent amendments, includes the following points:

(1) Maximum base price for reconditioned 50-55 gallon 18 gauge drums to be $2.25 each, delivered within a 50-mile radius.

(2) For lacquer re-lined and baked drums, maximum price to be base price plus 25c per unit.

(3) For non-reconditioned (raw) drums, 50-55 gallon capacity, 18 gauge, maximum price to be $1.60 per unit delivered to plant of user or reconditioner. In case user picks up drum at dumper's plant, maximum price to be $1.25 per unit.

(4) Maximum prices of other sizes and units not specified above, to be 80 per cent of the delivered price (as of October 1, 1941), excluding extras, quoted by Rheem Manufacturing Company or the Wheeling Corrugating Company, when delivered in carload lots, of new, black, hot-rolled steel drums of the same type and size.

(5) In certain cases, additional transportation charges over and above the base price maximums are permissible. Subsequent amendments to the schedule limit its application to certain sizes, and fix specific maximum prices for drums of 14-16, 29-33, and 50-55 gallon capacities at $1.45, $1.85, and $2.25 respectively (reconditioned and delivered).

Of extreme importance is an official O.P.A. interpretation of schedule 43, issued on January 30, 1942. This interpretation reads as follows: "Where product is sold in drums a deposit charge may be made to assure the return of the empty drums, in excess of the maximum price established by this schedule for such drums, as long as no sale of the drums is involved. If legal title to the drums remains with the filler, there is no violation. On the other hand, if the filler passes title to the drums as well as the contents, he may not purchase the drum after it has been emptied at a price above the maximum price of the schedule."

Many shippers are setting a high deposit on drums and other containers in order to insure their return at the earliest possible date for re-filling. In some cases, shippers are making additional deliveries of their product to a customer contingent upon the return of empty containers.

Conclusion

Conclusion: Issuance of the new PD-1A priority application forms, use of which is compulsory after March 15, 1942, should facilitate the procurement of drums and other containers in many cases. Form PD-1A differs from its predecessor PD-1 in that ratings granted thereon may be extended to suppliers and subsuppliers for material which will be physically incorporated into the end product to be ultimately delivered to the original recipient of the rating. Based upon a definition of the term "end product" recently made public by an Army and Navy Munitions Board Official, this includes *containers specifically called for in the application.* Thus a customer who applies on form PD-1A for a preference rating on 10,000 gallons of toluene must stipulate that this product be "delivered in 55 gallon drums," "delivered in 5 gallon cans," etc. in order that the supplier may extend the rating granted on the toluene to the container manufacturer for the requisite containers. This also applies to form PD-3A, utilized in applications for ratings on Army, Navy, and certain other Government contracts.

An American manufacturer who cannot show that a substantial portion of his output is directed toward the channels of war production or for shipment to the Allied Nations and Latin America, will have difficulty in obtaining requisite containers.

(*Continued from Page 369*)

Number 92, on soybean and peanut oils, OPA.

Prices in Fats and Oils Price Schedule Number 53, revised in Amendment Number 2, by OPA.

Cobalt in all forms, placed under allocation, in Conservation Order Number M-39-b, by WPB, with following exceptions to general restrictions of order, among others:

Military orders, and orders from certain other Government agencies, on ratings of A-1-j or higher, and for chemical catalysts, chemical reagents, laboratory and research equipment, pharmaceuticals, health supplies, cattle and plant foods, uses in glass industry, alloys of all kinds, dryers, hard facing compounds, and other metal industry purposes.

Order M-21-e, by WPB, thinning amount of tin in certain types of tin containers.

Maximum prices, in Price Schedule Number 20, on electrolytic copper, by OPA.

Ceiling prices have been asked by OPA in letters to nicotine sulfate industry, by OPA, preliminary to possible later price action by this agency.

Maximum prices, in Price Schedule Number 93, by OPA, on mercury or quicksilver.

Extension of limitations on cellophane uses, under Limitation Order L-20, which is extended to March 17, pending studies to determine further extension or a new order replacing L-20.

Ceiling prices amended in Price Schedule Number 16, covering raw sugar, by OPA.

Action preliminary to rationing sugar to all consumers taken by same agency, with rationing in virtual effect on primary distributors, under Price Schedule Number 60, Direct Consumption Sugars.

Allocation of raw sugar to both refiners and manufacturers, placed in effect by WPB.

Before this appears the stringency in the field of glycerine production will have resulted in an allocation order, due at this writing, and a series of recommendations to soap manufacturers, now in process of evolution, designed to conserve and augment supplies. This is dealt with elsewhere in the issue.

The Board of Economic Warfare has acted to curb excessive drains on stocks of medicinal or pharmaceutical preparations, chemicals, or drugs used solely for medicinal purposes, now on hand in the country.

Other actions either to conserve supplies, or halt runaway price trends, have been taken on dyestuffs, curtailing their use for civilian requirements and allotting higher amounts to military clothing, explosive production, and other essentials; on tung oil, involving an extension of General Preference Order M-57 restricting deliveries to preference rated orders of A-2 or higher, or for certain specified uses, to April 15; and limiting the practicable working minimum of wood pulp to a 60-day supply; all stocks of chlorinated rubber have been frozen except for specified purposes in an amendment to General Preference Order M-46; all fertilizer prices have been frozen; this by the way, is a 60-day action by OPA; Maximum Price Regulation Number 1; a survey of container production is under way, including collapsible tubes, etc.; drastic restrictions on chlorine have become operative as of March 1, in Order M-19. Pulp and paper manufacturers are under the same restriction in L-11 under which they already operate; a ceiling on nicotine sulfate is forecast; with voluntary price compliance already sought.

The WPB has extended to March 15 the date after which Forms PD-1-A and PD-3-A must be used in place of PD's-3, 4, and 5.

FOREIGN LITERATURE DIGEST

By T. E. R. Singer

THE EXTRACTION OF POTASSIUM SALTS FROM SEA WATER, Vol. L, No. 3 Ion (Madrid, Spain, October, 1941), p. 11-13.

The first experimental installation for obtaining potassium salts from sea water was set up in 1940 by the Norwegian company, Norsk Hydro Elektrisk Kvaelstof, A. S. Countries which do not have their own deposits of potassium salts can now obtain these salts without having to depend on outside sources. The author of this article, Dr. L. Blas, goes on to give statistics on the amount of K_2O consumed as fertilizer in various countries.

Although at present Spain has an extensive supply of carnalite, it is not an unlimited supply, and it was therefore considered of interest to make a study of the early work on obtaining potassium salts from sea water. The first experiments started with the mother liquors from the crystallization of sodium chloride in salt pits, as described in an accompanying flowsheet. Up to 90% of the potassium chloride existing in the mother liquors from salt pits (which contain 3-5% KCl) was obtained by this method. However, this method would require a plant for each salt pit, and each average pit could produce only some 500 tons of potassium chloride. In view of this situation attention has been directed to the isolation of potassium from sea water by precipitation of the potassium ion.

One of the methods studied by the author involved the use of sodium bitartrate as the precipitating agent. The solubility of the potassium ion in the bitartrate form is 0.09%, and the potassium can be precipitated to this limit. The precipitating agent is easily recovered as tartaric acid. A flowsheet shows the steps in details. The high price of soda, however, makes it impractical to use this method commercially in Spain at the present.

The potassium content of various sea waters is as follows:

Atlantic Ocean	0.066-0.076%
North Sea	0.064-0.070%
Mediterranean Sea	0.001-0.050%
Pacific Ocean	0.060-0.065%
Dead Sea	0.047-0.438%

The Norwegian method is based on the use of dipicrylamine as the precipitating agent. This compound, obtained by the hexanitration of diphenylamine, has been known for some time in the synthetic dye industry, but has not been in use for several years. Its potassium salt is practically insoluble, but its calcium salt is relatively soluble. The direct addition of the calcium salt to sea water containing 0.4-0.5 K_2O per thousand, brings about the formation of a crystalline precipitate containing about 80% potassium dipicrylaminate, which is easily decomposed by acid.

This reagent does not precipitate either the magnesium or sodium salts and makes it possible to get technically pure potassium salts. In the patent directed to this method a description is given of a plant for production of 5,000 tons of K_2O per year. Such an installation would consume 1,750 cu.m. of sea water per hour (with a K_2O content of 0.43 per thousand) which would be mixed continuously with 50 cu.m. per hour of a calcium dipicrylaminate solution containing 5.6 tons of dipicrylamine. 0.57 tons of K_2O would be produced per hour.

MARKETS IN REVIEW

By Paul B. Slawter, Jr.

Heavy Chemicals — Fine Chemicals — Coal Tar Chemicals — Raw Materials — Agricultural Chemicals — Pigments and Solvents

MEN go out daily to die for this country; nations fall under the Axis war machine; once again, this time from the other side of the world, we hear the familiar cry—"too little and too late." The Japs have taken Java and they sweep on. The Dutch say they did not receive the help from this country that was promised. A few more war planes, a few more warships and the story might have been different.

Despite all this, strikes continued to impede production in this country according to figures released by the National Association of Manufacturers. In war industries during February there were 76 strikes in effect, involving 70,905 men and the loss of 2,028,824 man-hours of work. In January there were 43 strikes in war industries, involving 15,512 workers and 661,976 man-hours of work. In non-war industries there were 27 strikes which involved 11,773 men and the loss of 1,192,152 man-hours of work.

Wherever the fault lies, whether with management or labor or both (as this department believes is the case) something must be done and done quickly. We can't win this war when strikes throughout the country account for enough work hours to have built about five 170-foot steel submarine chasers. There are too many submarines in these waters anyhow.

Shipping will get a boost soon. Two vast programs are going into effect calling for the pooling of all available tonnage between the United Nations, and for speeding and expanding this country's shipbuilding program.

Allocations, it seems, will become more widespread as each day passes. Tightness in key supplies such as phenol arise from rapidly expanding war demands and substantial lend-lease exports. Among major chemical divisions which will feel the tightness especially are the pharmaceutical, paints and plastic producers.

Look for a tough rail car situation in May. It won't be bad enough for rationing freight car space, however, but you may expect this by next Fall. This Spring will bring forth peak carloadings.

Some of the things the government did this month are included here, picked up at random from information which comes into this office. Fabricators of metals were warned by the Chemicals Branch, WPB, to investigate every possible cleaning method other than chlorinated solvents applicable to their operations. Harshaw Chemical Co. was authorized by OPA to pay 11¼ cents a pound, f.o.b. shipping points, for such special purpose copper scrap as it requires. Date on which PD-1A and PD-3A forms must be used in place of PD-1, PD-3, PD-4 and PD-5 has been postponed from March 2 to March 15. WPB has moved to acquire possession of all idle aluminum inventories in the hands of fabricators. Fats and oils schedule No. 25 issued Aug. 28, 1941, has been revoked. This schedule was issued originally for the prevention of speculation, hoarding and undue price rises. Price ceiling order issue Feb. 3 remains unchanged. All stocks of chlorinated rubber in the U. S., except those going into specified uses, were frozen last month by the director of industry operations preparatory to requisitioning by the WPB. Exporters of paraffin wax have been notified by OPA not to buy from producers or jobbers at prices in excess of those allowed under Price Schedule No. 42 for ordinary domestic sales. Order restricting deliveries of tung oil to orders having a preference rating of A-2 or better, or for certain specified uses, has been extended to April 15. (For more detailed information on government actions affecting the chemical industry see Statistical and Technical Data Section of this issue.)

Heavy Chemicals: Discussions of specifications in liquid and potash soap manufacturing that would insure maximum production and conservation of glycerine were held last month by members of the Soap and Glycerine Industry Advisory Sub-Committee.

The suggestions of the group will assist the members of the main body to form their own proposals to the War Production Board in guiding the operations of the entire industry.

The liquid and potash soap manufacturers, whose product comes to approximately two per cent of the volume of the soap industry, are directed to get the maximum amount of glycerine out of their product to aid the nation in meeting its glycerine needs.

Large manufacturers will be asked to use their extensive equipment in deglycerinizing their oils as completely as possible. Smaller manufacturers may not be required to effect a complete recovery of the glycerine in their product because of the relatively small amount of glycerine obtained and the excessive cost of getting it.

Ways and means of making deglycerinized oils available to the smaller manufacturers and possible changes in government specifications on these products to permit maximum glycerine recovery, also were discussed.

Plants continue to operate at capacity and as a rule, no new business is accepted. Price developments are scarce. The industry's order affecting maintenance,

Preference Rating Order P-89

Information to Be Given by the Producer of Chemicals in a Request for an A-1-a or A-1-c Rating, by Telegram or Letter.

(1) **The name of the product or products whose production is already curtailed, or is threatened.**

(2) **The probable percentage loss in production.**

(3) **Facts showing the essentiality of this product (or products) for the war program, national welfare, or for government-sponsored enterprises. Here, if necessary, mention the other chief products whose manufacture is tied up with that of the threatened product.**

(4) **The nature of the emergency. Has the breakdown already occurred? If not, what circumstances show that a breakdown is likely? Is the situation in the plant hazardous? And is further damage to other equipment probable?**

(5) **The names and addresses of the ultimate Supplier or Suppliers with whom orders have been placed for the needed equipment.**

(6) **The nature, description, quantity, and cost of the materials required to repair or avert the breakdown. Also, if possible, give purchase order number, and date of same.**

(7) **Previous attempts to secure delivery by other means: Why the materials described cannot be obtained soon enough with an A-3 rating.**

(8) **Is any difficulty anticipated in securing delivery if the needed equipment incorporates allocated metal or metals?**

(9) **Name the member of the Chemicals Branch (if any) who knows applicant's business or the plant in question.**

(10) **Name, and serial number under P-89, of the company applying, and address of the plant in question.**

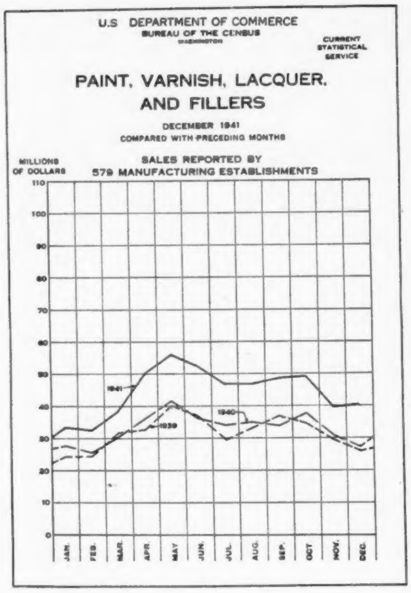
repair and operating supplies has been amended to clarify the broad terms of the first preference rating order P-89. Operating supplies have been re-defined to include any material which is essential to the operation of a producer's plant, including but not limited to lubricants, fuels, catalysts and small, perishable tools. (Yes, that's what it says.) Excluded are materials physically or chemically incorporated into the producers products. Serial numbers will be issued to enable companies working on war chemicals to take advantage of the provisions. Those chemicals which go into products used for the agricultural trade are in for plenty of play. Complete fertilizers will soon be in demand for the Spring season. Oxalic acid is extremely hard to get. There are more orders for bleaching powder than there is bleaching powder and producers are allocating shipments in an effort to supply industries who need the material most urgently. Alkali manufacturers have been requested to allocate a portion of their production to fill export orders for South America. This is going to cause postponements of some deliveries to consumers here.

Drastic restrictions on the use of chlorine were ordered by J. S. Knowlson, Director of Industry Operations, in an amendment to Order M-19. The order prohibits the use of chlorine or products containing available chlorine in the bleaching of foodstuffs, bleaching of wiping rags and waste and the manufacture of cosmetics and toilet preparations.

Curtailments are applied to the amount to be used in bleaching of textiles in shellac processing, in laundry operations, in the manufacture of home bleaching preparations, and in the sanitation of private swimming pools. Pulp and paper manufacturers are subject to the same regulations of Order L-11, under which they have been operating.

Producers of chlorine are instructed to make deliveries only on specific authorization of the Director of Industry Operations, with the exception of chlorine for water and sewage treatment. They are required to set aside from each month's production five per cent for delivery on specific instructions and enough additional to take care of their regular water and sewage treatment demands. Supplies for water and sewage treatment can be obtained in the same manner as in normal times. All other requests for delivery must be scheduled monthly and submitted to the War Production Board for action.

Use of chlorine in textile bleaching is restricted to approximately 50 per cent of the amount used for the year ending June 30, 1941. It is left to the discretion of the manufacturer how he shall use the chlorine allotted to him. Shellac bleaching is cut approximately 25 per cent under the same regulation. Although the quantity of bleached shellac produced under this regu-



lation will not be affected, the color will be slightly more yellow than so-called white shellac. All laundry operations must do without chlorine, with the exception of 10 per cent of former usage for stain conditions.

Manufacturers of sodium hypochlorite solutions in small containers for retail sale must reduce their use of chlorine by 40 per cent, and owners of private swimming pools must get along with 25 per cent of the amount used during the base period.

No restriction is placed upon public pools or those belonging to institutions, such as schools and other semi-public organizations.

A complete list of preference ratings, other than those for war requirements, is contained in the order. They range from A-2 for water and sewage treatment through to B-5 for less essential uses. It is believed sufficient chlorine will be available to fill at least some of the demands for all these ratings.

Fine Chemicals: Increased domestic and foreign demands for acetyl salicylic acid, commonly known as aspirin, have resulted in a shortage of supply. Speculation by others than producers has led to resale prices as high as $1.50 a pound in sharp contrast to the manufacturers' price of 40 cents per pound for a comparable grade and quantity. Further increases in resale prices are threatened.

After conferences with producers, resellers, and exporters of acetyl salicylic acid, and representatives of other Government agencies, the Office of Price Administration has found that no justifiable reasons exist for producers and primary jobbers charging prices in excess of their prevailing price of 40 cents per pound, or for resellers and exporters charging prices in excess of 52 cents and 56 cents per pound, respectively, for acetyl salicylic acid, either powdered or in crystals, for sales in large quantities. Increases in such prices would, consequently, be inflationary in character.

The following restrictions are contained in the mercury conservation order No. M-78:

1063.1 (b) Prohibition on Use of Mercury in Articles Appearing on List "A"—

(1) Unless otherwise specifically authorized by the Director of Priorities, any person using mercury in the manufacture of any item or in any manufacturing process on List "A" shall limit his use of mercury in the manufacture of any such item or in any such process between January 15, and March 31, 1942, to 50% of his use in the Base Period.

(2) Unless otherwise specifically authorized by the Director of Priorities, effective April 1, 1942, no mercury shall be used in the manufacture of any item on List "A."

LIST "A"—Carroting of hat fur, marine anti-fouling paint, thermometers (except industrial and scientific), treating of green lumber (except Sitka Spruce), turf fungicides, vermilion, wall switches for non-industrial use, wood preservation.

1063.1 (c) Restriction on Use of Mercury in Articles on List "B"—

Unless otherwise specifically authorized by the Director of Priorities, any person using mercury in the manufacture of any item or in any manufacturing process on List "B" shall limit his use of mercury in the manufacture of any such item or in any such manufacturing process between January 15, 1942 and March 31, 1942, and during each calendar quarter thereafter to the percentage of such use in the Base Period indicated opposite such item or such manufacturing process on List "B." —LIST "B"—Fluorescent lamps—100%; health supplies (as defined in Preference Rating Order P-29, as the same may be amended)—100%; Mercuric Fulminate for commercial blasting caps—125%; Mercuric Fulminate for ammunition—100%; Thermometers (industrial and scientific) —100%.

"Base Period" referred to above means at the option of the manufacturer either (1) the corresponding quarterly period in 1940, or (2) the first calendar quarter in 1941, provided that the same option shall be used throughout the calendar year.

Nicotine sulfate prices have been frozen by Leon Henderson under the following terms:

1. Producers of nicotine sulfate are not to sell, during the year 1942, 40 per cent nicotine sulfate for agricultural uses in 50-pound drums at prices in excess of 80 cents per pound delivered to distributors.

2. Producers of nicotine sulfate are not to sell, during the year 1942, 40 per cent nicotine sulfate for agricultural uses in 10-pound containers at prices in excess

of 90 cents per pound delivered to distributors.

3. Distributors and dealers in nicotine sulfate are not to make charges for handling nicotine sulfate in excess of $3.50 per 50-pound drum for distributors, and $3.75 for dealers, and $1.15 per 10-pound container for distributors, and $1.50 for dealers.

4. Schedules of 1942 prices to be quoted by producers are to be submitted to OPA in advance of publication.

5. The requests set forth above are subject to revision or modification in whole or in part in such manner and at such time as OPA may deem necessary or advisable.

Expect OPA action shortly on such products as tartaric acid, cream of tartar, quinine, vanillin and coumarin. Nicotinic acid price has been dropped to 50 cents a pound.

Coal Tar Chemicals: Unofficial inquiries by the U. S. Public Health Service have been started into safeguards against benzol poisoning in States where local regulations do not prohibit its use in industrial plants.

Meanwhile a rubber concern in this State making war products has appealed to Albany for permission to use benzol under certain ventilation conditions and provided that adequate tests of employes are made each week to guard against benzol poisoning. Similar appeals are reported to be pending in other States.

While the entire output of benzol is being sold with no difficulty, much of it is going into motor fuel to replace ethyl solutions to produce an anti-knock quality. This, according to proponents of relaxation of State regulations, readily could be diverted to such war products as balloon cloth, self-sealing tank plates and various other lacquers used for finishing a variety of war products.

Although a group of benzol producers was reported to be preparing pamphlets designed to show that benzol poisoning could be prevented with proper safeguards, such as adequate ventilation and frequent tests, some war producers were unwilling to wait for such aid and were appealing to State authorities. It was believed that special exemptions could be arranged under which technicians in the employ of either the States or the individual companies could supervise the safeguards.

The necessity for using all nitration grade toluol in production of explosives and all the non-nitration grades of toluol in finishing agents for war products has cut deeply into toluol supplies and made it impossible to obtain enough even for war uses. In many instances benzol can be substituted for toluol, but is forbidden by State regulations.

The Neville Co., maker of coal tar products and chemicals in Pittsburgh, Pa., announces that it has perfected a new hydrocarbon solvent called Notol No. 1 which may be used in industry in place of toluol. Toluol which was first made from coal tar and now also from petroleum is all preempted for the production of TNT for explosives. It is expected to be used in the nitro-cellulose lacquers and finishes of the Duco type.

War requirements continue to dominate the market for coal tar chemicals. WPB is allocating shipments of such chemicals as phenol, toluol and diphenylamine. Tar acids are scarce. Intermediates are in great demand. Restricted shipments are going to dyestuff manufacturers and chemical processors not directly engaged in war production work. Among the products hard to get are: aniline, beta-naphthol, dimethylanilin, dinitrotoluene, metanitroparatoluidin, monochlorobenzene, orthocresol, orthotoluidin, phthalic anhydride and thiocarbanilide.

Raw Materials: Commodity Credit Corporation has advanced the parity prices on 1940 rosin by seven cents per hundred pounds. Tremendous expansion in the demands for pine oil for flotation purposes are expected under the program the government has outlined to recover minerals from low grade areas. This would mean a corresponding increase in the consumption of gum and wood turpentine for the creation of more adequate supplies of pine oil.

Development of rubber reclaiming solvents, plasticizers, and tackifiers derived from the Southern pine will help alleviate a growing shortage of these materials, according to Hercules Powder. Improvement of these materials in recent months through extensive laboratory and mill tests has made possible a more uniform reclaimed product.

The company is constructing a new unit at its Brunswick, Ga., naval stores plant for the manufacture of "Tarol" and "Solvenol," its rubber solvents and plasticizers. Existing equipment used in the production of other naval stores products is also being converted to manufacture the materials in anticipation of greater demand for rubber reclaiming materials.

A new source of industrial alcohol and sugar is being exploited by the Department of Agriculture. Government is developing 10,000 acres of sorghum in Louisiana, which tract alone could produce 800,000 gallons of industrial alcohol. Research workers are developing new uses for anthracite as a substitute for bituminous coke in steel mill blast furnaces.

Fertilizer Materials: Office of Price Administration has issued temporary regulations establishing maximum prices for mixed fertilizer, superphosphate and potash at prices prevailing Feb. 21.

Freezing of fertilizer prices announced by the O.P.A. is considered as constructive to the position of the industry which in the past has frequently been demoralized by widespread price cutting. The order indicates that supplies will hardly be sufficient to meet potential large demands, and the industry therefore seems assured of a large volume of business at a fair margin of profit.

Metals: Metals Reserve Co. has extended its chrome ore purchasing program to include purchases in truckload lots direct from Miners of Oregon and northern California. Dow Chemical Co. expects to double its output of magnesium from the sea sometime this Fall. WPB has just announced a new program boosting future annual production of aluminum to 2,100 million pounds and magnesium to 725 million pounds. Ford Motor Co. and Union Carbide are going into the magnesium business, each company using a new process.

Carbide's process starts with dolomite ore, one of the most abundant mineral sources of magnesium. The ore is dried, and then made into briquettes with ferro-silicon, a steel alloy material made on a large scale by Union Carbide. These briquettes are then treated, either in a type of retort similar to that used in refining zinc, or in a specially designed electric furnace. Magnesium comes off in vapor form, but since it is not in contact with air or with any inflammable gases, there is no danger of explosion.

This ferro-silicon process has no connection with the processes using dolomite now being developed by Mathieson Alkali Works, International Mineral, and Basic Refractories, which use an electric cell of the type similar to that used for making chlorine.

Manager of Potash Sales

E. M. Kolb, with American Potash & Chemical since 1932, was made manager of potash sales of that company last month.

EDITORIAL

(Continued from page 322)

to guard their professional standing at every turn despite this favorable outcome of the Emeryville case. Those who favor licensing will probably continue to stress the logic of such procedure as one of the most sound ways of still further cementing the position of the chemist as a professional man or woman. The Emeryville victory does not answer the question of whether or not a professional man must join against his wishes a collective bargaining group made up entirely of fellow-professional men if the majority in his laboratory so desire to form and speak through such a group. Will such groups be formed? Will they be local in all cases if formed, or will some national body propose to form such groups and to speak for them?

Heavy Chemicals, Coal-Tar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Petroleum Solvents and Chemicals, Naval Stores, Fats and Oils, etc.

PRICES CURRENT

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f.o.b. works are specified as such. Import chemicals are so designated.

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1940 Average $1.20 - Jan. 1941 $1.16 - Feb. 1942 $0.97

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Acetaldehyde, 99%, 55, 110 gal drs, wks ... lb.	...	.11	.11	.11	.11	.11
Acetaldol (Aldol), 55, 110 gal drs, c-l, wks ... lb.	...	.12	.12	.12	.11	.13
Acetamide, tech, kgs, wks . lb.	.28	.45	.28	.45	.28	.45
Acetanilid, tech, cryst, bbls ... lb.	.29	.31	.29	.31	.29	.31
powd, bbls ... lb.	.27	.29	.27	.29	.27	.29
Acetic Anhydride, drs, c-l, frt all'd ... lb.	.11½	.13	.11½	.13	.10½	.13
Acetin, tech, lcl drs ... lb.	...	.29	.29	.29	.29	.33
Acetone, tks, delv (*PC*) .. lb.	.07	.158	.07	.158	.06	.158
drs, c-l, delv (*PC*) ... lb.	.08½	.173	.08½	.173	.07½	.173
Acetonitrile, drs, wks ... lb.	1.00	2.00	1.00	2.00	1.00	2.00
Acetophenone, drs ... lb.	1.55	1.60	1.55	1.60	1.55	1.60
Acetophenetidin, bbls, kgs, 1000 lbs ... lb.	...	1.00	1.00	1.00	1.00	1.00
ACIDS						
Acetic, 28%, bbls (*PC*) 100 lbs.	3.38	3.63	3.38	3.63	2.23	3.43
glacial, nat, bbls .. 100 lbs.	9.15	9.40	9.15	9.40	7.62	8.55
synth, drs ... 100 lbs.	9.15	9.40	9.15	9.40	7.62	8.55
tks, wks ... 100 lbs.	6.25	6.93	6.25	6.93	...	...
Acetylsalicylic, USP, (*PC*) special, 200 lb bbls ... lb.	...	.45	.45	.45	.45	.45
Standard USP ... lb.	...	.40	.40	.40	.40	.40
Adipic, fib drs, wks ... lb.	...	.31	.31	.31	.31	.31
Anthranilic, ref'd bbls ... lb.	1.20	1.25	1.20	1.25	1.15	1.20
tech, bbls ... lb.	...	.95	.95	.95	.75	.95
Ascorbic, bots, drs (*PC*) oz.	1.65	1.85	1.65	1.85	1.85	2.10
Battery, cbys, wks .. 100 lbs.	1.60	2.55	1.60	2.55	1.60	2.55
Benzoic, tech, bbls ... lb.	.43	.47	.43	.47	.43	.47
USP, bbls ... lb.	.54	.59	.54	.59	.54	.59
Boric, tech, gran, frt all'd bgs 50 tons ... ton *a*	...	99.00	99.00	99.00	93.50	99.50
bbls ... ton *a*	...	109.00	108.00	109.00	108.00	108.00
Broenner's, bbls ... lb.	...	1.11	1.11	1.11	1.11	1.11
Butyric, c-l drs, wks ... lb.	...	.22	.22	.22	.22	.22
tks, wks ... lb.	...	.21	.21	.21	.21	.21
Caproic, drs, wks ... lb.	.25	.30	.25	.30	.25	.30
Chlorosulfonic, drs, wks .. lb.	.03	.04½	.03	.04½	.03½	.05
tks, wks ... lb.	...	.02½	.02½	.02½	...	...
Chromic, drs (*FP*) ... lb.	.16¼	.18¼	.16¼	.18¼	.15¼	.17¼
Citric, crys, gran, bbls .. lb. *b*	.20	.21	.20	.21	.20	.21
Anhyd gran, drs (*PC*) lb.	.23	.26½	.23	.26½	.23	.26½
Cleve's bbls ... lb.	...	.65	.65	.65	.65	.65
Cresylic 50%, 210-215° HB, drs, wks, frt equal (A) gal.	.81	.86	.81	.86	.76	.84
Low Boiling ... gal.	.81	.86	.81	.86	.76	.84
Formic, tech, cbys ... lb.	.10½	.11½	.10½	.11½	.10½	.11½
Fumaric, bbls ... lb.	.27	.31	.27	.31	.24	.29
Gallic, tech, bbls ... lb.	1.10	1.12	1.10	1.13	.90	1.13
NF bbls ... lb.	1.27	1.30	1.27	1.30	1.10	1.30
H, bbls wks ... lb.	...	.45	.45	.45	.45	.45
Hydrochloric, see muriatic						
Hydrocyanic cyls, wks ... lb.	.80	1.00	.80	1.00	.80	1.00
Hydrofluoric, 30%, bbls, wks ... lb.	.06	.06½	.06	.06½	.06	.06½
Hydrofluosilic, 35%, bbls lb.	.09	.09½	.09	.09½	.09	.09½
Lactic, 22% dark, bbls ... lb.	.029	.035	.029	.035	.02½	.035
22%, light, bbls wks ... lb.	.039	.0415	.039	.0415	.03½	.0415
44%, dark, bbls wks ... lb.	.063	.0655	.063	.0655	.05½	.0655
44%, light, bbls wks ... lb.	.073	.0755	.073	.0755	.06½	.073
Lauric, dist, tech, drs ... lb.	.20	.20½	.20	.20½	.15	.18¾
Laurent's bbls ... lb.	...	.45	.45	.45	.45	.45
Maleic, powd, drs ... lb.	...	.30	.30	.30	.30	.30
Anhydride, drs ... lb.	.25	.26	.25	.26	.25	.26
Malic, powd, kgs ... lb.	...	.47	.47	.47	.47	.47
Mixed, tks N unit ... lb.	.05	.06	.05	.06	.05	.06
S unit ... lb.	.0085	.009	.0085	.009	.0085	.009
Molybdic, kgs, wks ... lb.	.95	1.10	.95	1.10	.95	1.10
Monochloracetic, tech, bbls ... lb.	...	.17	.17	.17	.15	.18
Monosulfonic, bbls ... lb.	...	1.50	1.50	1.50	1.50	1.50
Muriatic, 18° cbys, c-l wks ... 100 lb.	...	1.50	1.50	1.50	1.50	1.50
tks, wks ... 100 lb.	...	1.05	1.05	1.05	1.05	1.05
20° cbys, c-l, wks .. 100 lb.	...	1.75	1.75	1.75	1.75	1.75
tks, wks ... 100 lb.	...	1.15	1.15	1.15	1.15	1.15
Acid (continued):						
22° cbys, c-l, wks .. 100 lb.	...	2.25	2.25	2.25	2.25	2.25
tks, wks ... 100 lb.	...	1.65	1.65	1.65	1.65	1.65
CP cbys ... lb.	.06½	.08	.06½	.08	.06½	.08
Myristic, dist, drs ... lb.	.18	.18½	.18	.18½	.18	.18½
Naphthenic drs, 220-230 .. lb.	...	.10	.10	.10	.10	.10
tks, wks ... lb.	...	.09	.09	.09	.09	.09
Naphthionic, tech, bbls ... lb.	.60	.65	.60	.65	.60	.65
Nicotinic cns ... lb.	...	7.15	7.15	7.15	7.15	7.15
Nitric, 36°, cbys, c-l, wks ... 100 lbs. *c*	...	5.00	5.00	5.00	5.00	5.00
38°, c-l, cbys, wks 100 lbs. *c*	...	5.50	5.50	5.50	5.50	5.50
40°, c-l, cbys, wks 100 lbs. *c*	...	6.00	6.00	6.00	6.00	6.00
42°, c-l, cbys, wks 100 lbs. *c*	...	6.50	6.50	6.50	6.50	6.50
CP, cbys ... lb.	.11½	.13	.11½	.13	.11½	.13
Oxalic, bbls, wks (*PC*) .. lb.	.11¼	.14½	.11¼	.14½	.11½	.14¼
Phosphoric, 85% USP, cbys ... lb.	...	.12	.12	.12	.12	.12
50% food grade, c-l, bbls, wks, frt equal .. 100 lbs.	4.00	4.25	4.00	4.25	4.00	4.25
Picramic, kgs ... lb.	.65	.70	.65	.70	.65	.70
Picric, bbls, wks ... lb.	...	.35	.35	.35	.35	.35
Propionic, pure, drs, wks lb.	...	.14	.14	.14	.14	.14
tks, wks ... lb.	...	.11	.11	.11	.11	.11
Pyrogallic, tech, lump, pwd, bbls ... lb.	...	1.45	1.45	1.45	1.45	1.45
USP, cryst, cns ... lb.	...	2.10	2.10	2.10	1.70	2.25
Pyroligneous, bbls, delv gal.	...	.25	.25	.25	.25	.25
Ricinoleic, tech, drs, wks lb.	.32	.37	.32	.37	.32	.37
Salicylic, tech, 125 lb bbls, wks (*PC*) ... lb.	...	.33	...	.33	...	.33
USP, bbls ... lb.	.35	.46	.35	.46	.35	.40
Sebasic, tech, bbls, wks .. lb.	...	.82	.82	.82	.82	.82
Stearic, see under Oils & Fats						
Succinic, bbls ... lb.	...	.75	...	.75	...	.75
Sulfanilic, 250 lb drs, wks lb.	...	.17	...	.17	...	.17
Sulfuric, 60°, tks, wks .. ton	...	13.00	...	13.00	...	13.00
c-l, cbys, wks ... 100 lb.	...	1.25	...	1.25	...	1.25
66°, tks, wks ... ton	...	16.50	...	16.50	...	16.50
c-l, cbys, wks ... 100 lb.	...	1.50	...	1.50	...	1.50
CP, cbys, wks ... lb.	.06½	.08	.06½	.08	.06½	.08
Fuming (Oleum) 20% tks, wks ... ton	...	19.50	...	19.50	18.50	19.50
Tannic, tech, 300 lb bbls .. lb.	.71	.73	.71	.73	.54	.73
Tartaric, USP, gran, powd, 300 lb bbls ... lb.	...	.70½	...	.70½	.46¼	.70½
Tobias, 250 lb bbls ... lb.	.55	.60	.55	.60	.55	.60
Trichloroacetic bottles ... lb.	2.00	2.50	2.00	2.50	2.00	2.50
Tungstic, pure, 100 lb pkg. lb.	...	2.86	...	2.86	no prices	
Acrylonitrile, tks ... lb.	...	.34	.34	.34	...	...
Albumen, light flake, 225 lb bbls ... lb.	.65	.75	.65	.75	.55	.75
dark, bbls ... lb.	.12½	.14	.12½	.14	.13	.18
egg, edible ... lb.	1.80	1.85	1.80	1.85	.65	1.85
Alcohol, Amyl (from Pentane) tks, delv ... lb.	...	.131	...	.131	.111	.131
c-l, drs, delv ... lb.	...	.141	...	.141	.121	.141
lcl, drs, delv ... lb.	...	.151	...	.151	.131	.151
Amyl, normal lcl drs Wyandotte, Mich. ... lb.	...	.42	.27	.42	.25	.27
secondary, tks, delv ... lb.						
drs, c-l, delv E of Rockies ... lb.	...	.09½	...	.09½	...	.09½
tertiary, rfd, lcl, drs, f.o.b., Wyandotte, frt all'd ... lb.	...	.09	...	.09	...	.09
Benzyl, cans ... lb.	.65	.75	.65	.75	.65	.75
Butyl, normal, tks, f.o.b. wks, frt all'd (*PC*) .. lb.	.13½	.168	.12½	.168	.09	.158
c-l, drs, f.o.b. wks, frt all'd ... lb.	.14	.173	.13½	.173	.10	.168
Butyl, secondary, tks, delv ... lb.	...	.08½	...	.08½	.07¼	.08½
c-l, drs, delv ... lb.	...	.09½	...	.09½	.08¼	.09½
Butyl, tert denat c-l drs lb.	...	.12½	...	.12½	...	.12½
lcl drs ... lb.	...	.13	...	.13	...	.13
tks ... lb.	...	.11½	...	.11½	...	.11½
Capryl, drs, crude, wks lb.	...	.16	...	.16	...	.16
Cinnamic, bottles ... lb.	3.00	3.60	3.00	3.60	2.33	3.60
Denatured, CD, 14, c-l drs, wks (*PC, FP*) gal.	...	.65	...	.65	.36½	.45½
tks, East, wks ... gal.	...	.58	...	.58	.26½	.58
Denatured, SD, No. 1, tks,	...	.53	...	.53	.28½	.53

a Powdered boric acid $5 a ton higher; USP $25 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls; Prices are f.o.b. N. Y., Chicago, St. Louis, deliveries ½c higher than NYC prices; *y* Price given is per gal.

(*A*) Allocations. (*FP*) Under full priority control. (*PC*) Under price ceiling.

c Yellow grades 25c per 100 lbs. less in each case. *d* Prices given are Eastern schedule; Territories other east of Rockies and 15½c per gal. less than Eastern Works price.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Alcohols (continued):						
Diacetone, pure, c-l drs, delv ... lb. *f*	.11½	.14½	.11½	.14½	.09½	.13
tks, delv ... lb.	.10½	.13½	.10½	.13½	.10½	.13½
tech, contract, drs, c-l, delv ... lb.	.11	.13½	.11	.13½	.09	.12
tks, delv ... lb.	.10	.14	.10	.14	.10	.12½
Ethyl, 190 proof molasses, tks ... gal. *g*	...	8.12	...	8.12	5.96½	8.12
c-l, drs ... gal. *g*	...	8.19	...	8.19	6.02½	8.19
c-l, bbls ... gal. *g*	...	8.25	...	8.25	6.03½	8.25
Furfuryl, tech, 500 lb. drs lb.	.20	.25	.20	.25	.20	.25
Hexyl, secondary tks, delv lb.	...	.23	...	.23	.12	.23
c-l, drs, delv ... lb.	...	.24	...	.24	...	.13
Isoamyl, prim, cans, wks lb.	...	.32	...	.32	...	.32
drs, lcl, delv ... lb.	...	.22½	...	.22½	.22½	.27
Isobutyl, ref'd, lcl, drs lb.	...	.086	...	.086	.079	.086
c-l, drs ... lb.	...	.076	...	.076	.069	.076
tks ... lb.	...	.076	...	.076	.069	.076
Ethylhexyl, tks, wks ... lb.	.23	.23	.23	.23	.23	.23
Isopropyl, ref'd, 91% drs, frt all'd ... gal.	.40½	.43½	.40½	.43½	.40½	.43½
tks, frt all'd ... gal.	...	.34	.34	.34	.34	.34
99%, drs, frt all'd ... gal.	.44	.47	.44	.47	.44	.47
tks, frt all'd ... gal.	...	.37½	.37½	.37½	.37½	.37½
Octyl, see Ethylhexyl						
Polyvinyl A fib drs ... lb.	...	.54	.54	.54	.26	.54
B fib drs ... lb.	.65	.70	.65	.70	...	...
Propyl, nor, drs, wks gal.	.69	.75	.69	.75	...	...
Spec Solvents, East, drs, wks ... gal.	.67	.70	.67	.70	...	...
tks, East, wks ... gal.	.61	.66	.61	.66	...	...
Tetrahydrofurfuryl drs, f.o.b. wks ... lb.	.44	.50	.44	.50	...	...
Aldehyde ammonia, 100 gal drs ... lb.	.65	.70	.65	.70	.65	.70
Aldehyde Bisulfite, bbls, delv ... lb.	...	.17	...	.17	...	.17
Aldol, 95%, 55 and 110 gal, drs, delv ... lb.	.12	.15	.12	.15	.11	.15
Alphanaphthol, crude, 300 lb bbls ... lb.	...	.52	...	.52	...	.52
Alphanaphthylamine, 350 lb bbls ... lb.	...	.32	...	.32	...	.32
Alum, ammonia, lump, c-l, bbls, wks ... 100 lb.	...	4.25	...	4.25	3.75	4.25
delv NY, Phila ... 100 lb.	...	4.25	...	4.25	3.75	4.25
Granular, c-l, bbls wks ... 100 lb.	...	4.00	...	4.00	3.50	4.00
Powd, c-l, bbls, wks 100 lb.	...	4.40	...	4.40	3.90	4.40
Potash, lump, c-l, bbls, wks ... 100 lb.	...	4.50	...	4.50	4.00	4.50
Granular, c-l, bbls, wks ... 100 lb.	...	4.25	...	4.25	3.75	4.25
Powd, c-l, bbls, wks 100 lb.	...	4.65	...	4.65	4.15	4.65
Soda, bbls, wks ... 100 lb.	...	3.25	...	3.25	...	3.25
Chrome, bbls ... 100 lb.	.12½	.15	.12½	.15	no prices	
Aluminum metal, c-l, (*FP*) ... 100 lb.	15.00	16.00	15.00	16.00	17.00	18.00
Acetate, 20%, nor sol, bbls ... lb.	.10½	.11	.10½	.11	.10½	.11
Basic powd, bbls, delv lb.	.40	.50	.40	.50	.35	.50
24% sol, bbls, delv lb.	.10½	.11	.10½	.11	.09½	.12
Chloride anhyd 99% wks lb.	.08	.12	.08	.12	.08	.12
Crystals, c-l, drs, wks lb.	.06	.06½	.06	.06½	.06	.06½
Solution, drs, wks ... lb.	.02¾	.03¼	.02¾	.03¼	.02¾	.03¼
Formate, 30% sol bbls, c-l, delv ... lb.	.13	.15	.13	.15	.13	.15
Hydrate, 96%, light, 90 lb. bbls, delv ... lb.	...	.14½	...	.14½	.12½	.14½
heavy, bbls, wks ... lb.	...	.034	...	.034	.029	.03½
Oleate, drs ... lb.	.17½	.20	.17½	.20	.17½	.20
Palmitate, bbls ... lb.	.25	.26	.25	.26	.20½	.26
Resinate, pp., bbls ... lb.	...	.15	...	.15	...	.15
Stearate, 100 lb bbls ... lb.	...	.23	...	.23	.18	.23
Sulfate, com, c-l, bgs, wks ... 100 lb.	1.15	1.25	1.15	1.25	1.15	1.25
c-l, bbls, wks ... 100 lb.	1.35	1.45	1.35	1.45	1.35	1.45
Sulfate, iron-free, c-l, bgs, wks ... 100 lb.	1.75	1.85	1.75	1.85	1.60	1.85
c-l, bbls, wks ... 100 lb.	1.95	2.05	1.95	2.05	1.80	2.10
Ammonia anhyd fert com, tks lb.	.04½	.05	.04½	.05	.04½	.05
Ammonia anhyd, 100 lb cyl lb.	...	.16	...	.16	...	.16
26°, 800 lb drs, delv ... lb.	.02¼	.02½	.02¼	.02½	.02¼	.02½
Aqua 26°, tks, NH_3 cont.	...	.08z	...	.08z	.04	.05¼
Ammonium Acetate, kgs ... lb.	.27	.33	.27	.33	.27	.33
Bicarbonate, bbls, f.o.b. wks ... 100 lb	.0564	.0614	.0564	.0614	.0564	.0614
Bifluoride, 300 lb bbls ... lb.	.15½	.18	.15½	.18	.14	.18
Carbonate, tech, 500 lb bbls ... lb.	.08¼	.09¼	.08¼	.09¼	.08¼	.09¼
Chloride, White, 100 lb. bbls, wks ... 100 lb.	4.45	...	4.45	...	4.45	...
Gray, 250 lb bbls, wks ... 100 lb.	5.50	5.75	5.50	5.75	5.50	5.75
Lactate, 500 lb bbls ... lb.	.15	.16	.15	.16	.15	.16
Laurate, bbls ... lb.	...	.23	...	.23	...	.23
Linoleate, 80% anhyd, bbls ... lb.	...	.12	...	.12	...	.12
Nitrate, tech, bgs, bbls lb.	.0435	.0455	.0435	.0455	.0435	.0455
Oleate, drs ... lb.	...	.14	...	.14	...	.14
Oxalate, neut, cryst, powd, bbls ... lb.	.23	.29	.23	.29	.19	.29
Perchlorate, kgs ... lb.	.55	.65	.55	.65	.55	.65
Persulfate, 112 lb kgs lb.	.21	.23	.21	.23	.21	.22

z On a f.o.b. wks. basis.

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Ammonium (continued):						
Phosphate, diabasic tech, powd, 325 lb bbls ... lb.	.07¼	...	.07¼	.09¼	.07¼	.09¼
Ricinoleate, bbls ... lb.	...	.15	...	.15	...	.15
Stearate, anhyd, bbls ... lb.	...	.24½	...	.24½	...	.24½
Paste, bbls ... lb.	...	.06½	...	.06½	...	.06½
Sulfate, dom, f.o.b., bulk ton	29.00	30.00	29.00	30.00	29.00	30.00
Sulfocyanide, pure, kgs ... lb.	.45	.55	.45	.55	.45	.65
Amyl Acetate (from pentane)						
tks, delv ... lb.	...	.145	...	.145	.105	.145
c-l, drs, delv ... lb.	...	.155	...	.155	.115	.155
lcl, drs, delv ... lb.	...	.165	...	.165	.125	.165
tech drs, ex-fusel oil delv lb.	...	.14½	...	.14½	...	.14½
Secondary, tks, delv ... lb.	...	.08½	...	.08½	...	.08½
c-l, drs, delv ... lb.	...	.09½	...	.09½	...	.09½
tks, delv ... lb.	...	.08½	...	.08½	...	.08½
Chloride, norm, drs, wks ib.	.56	.68	.56	.68	.56	.68
mixed l c l drs, wks lb.	...	.08	...	.08	.0565	.08
tks. wks ... lb.	...	.06	...	.06	.0465	.06
Amyl Ether (see Diamyl						
lcl, dms ... lb.	...	.102	...	.102	...	...
cl, dms ... lb.	...	.095	...	.095	...	...
tks ... lb.	...	.085	...	.085	...	...
Mercaptan, drs, wks ... lb.	...	1.10	...	1.10	...	1.10
Oleate, lcl, wks, drs ... lb.	...	.31	...	.31	.25	.31
Stearate, lcl, wks, drs ... lb.	...	.32½	...	.32½	.26	.335
Amylene, drs, wks ... lb.	.102	.11	.102	.11	.102	.11
tks, wks ... lb.	...	.09	...	.09	...	.09
Amylnaphthalenes, see Mixed Amylnaphthalenes						
Aniline Oil, 960 lb drs and tks ... lb.	...	.14½	...	.14½	...	.14½
Annatto fine ... lb.	.34	.39	.34	.39	.34	.39
Anthracene, 80-85% ... lb.	...	.55	...	.55	...	.55
Anthraquinone, sublimed, 125 lb bbls ... lb.	...	.70	...	.70	.65	.70
Antimony metal slabs, ton lots ... lb.	.14	nom.	.14	nom.	.14	.16½
Butter of, see Chloride						
Chloride, soln, cbys ... lb.	...	.17	...	.17	...	.17
Needle, powd, bbls ... lb.	.18½	.20	.18½	.20	.16	.18
Oxide, 500 lb bbls ... lb.	.15	.16½	.15	.16½	.12	.16½
Salt, 63% to 65%, drs lb.	...	.34	...	.34	.28	.34
Archil, conc, 600 lb bbls lb.	...	.26	...	.26	no prices	
Aroclors, wks ... lb.	.18	.30	.18	.30	.18	.30
Arrowroot, bbls ... lb.	.10¼	.10¾	.10¼	.10¾	.09½	.10¾
Arsenic, Metal ... lb.	no prices		no prices		no prices	
Red, 224 lb cs kgs ... lb.	no prices		no prices		no prices	
White, 112 lb kgs ... lb.	.04	.04¾	.04	.04¾	.03½	.04¾
B						
Barium Carbonate precip, 200 lb bgs, wks ... ton	55.00	65.00	55.00	65.00	45.00	65.00
Nat (witherite) 90% gr, c-l, wks, bgs ... ton	...	43.00	...	43.00	...	43.00
Chlorate, 112 lb kgs, NY lb.	...	.60	...	.60	...	.45
Chloride, 600 lb bbls, delv, zone 1 ... ton	77.00	92.00	77.00	92.00	77.00	92.00
Dioxide, 88%, 690 lb drs lb.	...	.10	...	.10	...	.10
Hydrate, 500 lb bbls ... lb.	.06	.07	.06	.07	.05½	.07
Nitrate, bbls ... lb.	.10½	.12½	.10½	.12½	.08½	.12½
Barytes, floated, 350 lb bbls c-l, wks ... ton	...	27.65	...	27.65	25.15	27.65
Bauxite, bulk, mines ... ton	7.00	10.00	7.00	10.00	7.00	10.00
Bentonite, c-l, 325 mesh, bgs, wks ... ton	...	16.00	...	16.00	...	16.00
200 mesh ... ton	...	11.00	...	11.00	...	11.00
Benzaldehyde, tech, 945 lb. drs, wks ... lb.	.45	.55	.45	.55	.45	.55
Benzene (Benzol), 90%, Ind. 8000 gal tks, ft all'd gal.	...	.15	...	.15	.14	.15
90% c-l, drs ... gal.	...	.20	...	.20	.19	.20
Ind pure, tks, frt all'd gal.	...	.15	...	.15	.14	.15
Benzidine Base, dry, 250 lb. bbls ... lb.	...	.70	...	.70	...	.70
Benzoyl Chloride, 500 lb drs lb.	.23	.28	.23	.28	.23	.28
Benzyl Chloride, 95-97% rfd, drs ... lb.	.22	.24	.22	.24	.19	.24
Beta-Naphthol, 250 lb bbls, wks ... lb.	.23	.24	.23	.24	.23	.24
Naphthylamine, sublimed, 200 lb bbls ... lb.	1.25	...	1.25	...	1.25	1.35
Tech, 200 lb bbls ... lb.	...	.51	...	.51	.51	.52
Bismuth metal ... lb.	...	1.25	...	1.25	...	1.25
Chloride, boxes ... lb.	...	3.00	...	3.00	3.00	3.25
Hydroxide, boxes ... lb.	3.35	3.46	3.35	3.46	3.35	3.46
Oxychloride, boxes ... lb.	3.10	3.19	3.10	3.19	3.10	3.19
Subbenzoate, boxes ... lb.	...	3.40	...	3.40	...	3.40
Subcarbonate, kgs ... lb.	1.59	1.85	1.59	1.85	1.59	1.85
Subnitrate, fibre, drs ... lb.	1.29	1.57	1.29	1.57	1.20	1.57
Trioxide, powd, boxes lb.	...	3.65	...	3.65	...	3.65
Blanc Fixe, Pulp, 400 lb. bbls, wks ... ton *h*	40.00	46.50	40.00	46.50	35.00	46.50
Bleaching Powder, 800 lb drs, c-l, wks, contract 100 lb.	2.25	3.10	2.25	3.10	2.00	3.10
lcl, drs, wks ... lb.	2.50	3.35	2.50	3.35	2.25	3.35
Blood, dried, f.o.b., NY unit	...	5.35	5.25	5.35	4.75	5.25
Chicago, high grade ... unit	...	5.60	5.40	5.60	5.00	5.40
Imported shipt ... unit	...	5.20	5.00	5.20	4.75	5.00
Blues, Bronze Chinese						
Prussian Soluble ... lb.	...	.36	...	.36	.33	.36
Milori, bbls ... lb.	...	.36	...	.36	.33	.36
Ultramarine,* dry, wks, bbls ... lb.	...	.11	...	.11	...	.11
Regular grade, group 1 lb.	.16	.27	.16	.27	.16	.20
Pulp, Cobalt grade ... lb.	.22	.24	.22	.24	.22	.24

h Lowest price is for pulp, highest for high grade precipitated; *i* Crystals $6 per ton higher; USP, $15 higher in each case; * Freight is equalized in each case with nearest producing point.

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Bone, 4½ + 50% raw, Chicago ton	39.00	40.00	39.00	40.00	30.00	40.00
Bone Ash, 100 lb kgs lb.	.06	.07	.06	.07	.06	.07
Meal, 3% & 50% imp ton	...	37.50	...	37.50	31.50	37.50
Domestic, bgs, Chicago ton	38.00	40.00	38.00	40.00	32.00	40.00
Borax, tech, gran, 80 ton lots, bgs, delv ton *j*	...	45.00	...	45.00	43.00	45.00
bbls, delv ton *j*	...	54.00	...	54.00	53.00	56.00
Tech, powd, 80 ton lots, bgs ton	...	50.00	...	50.00	48.00	50.00
bbls, delv ton	...	59.00	...	59.00	58.00	61.00
Bordeaux Mixture, drs lb.	.11	.11½	.11	.11½	.11	.11½
Bromine, cases lb.	.25	.30	.25	.30	.25	.30
Bronze, Al, pwd, 300 lb drs (*FP*) lb.	...	.59	...	.59	...	.57
Gold, blk lb.	.60	.65	.60	.65	.60	.65
Butanes, com 16-32° group 3 tks lb.	...	.02½	...	.02½	.02½	.03
Butyl, acetate, norm drs, frt all'd lb.	.14½	.168	.14½	.168	.10	.168
tks, frt all'd lb.	.13½	.158	.13½	.158	.09	.158
Secondary, tks, frt all'd lb.	...	.08½	...	.08½	.07¼	.08½
drs, frt all'd lb.	...	.09½	...	.09½	.08¾	.09½
Aldehyde, 50 gal drs, wks lb.	.15½	.17½	.15½	.17½	.15½	.17½
Carbinol, norm (see Normal Amyl Alcohol)						
Chloride, normal lcl, drs lb.	...	.35	.28	.35	...	...
c-l, drs lb.	...	.32	.25	.32	...	...
Crotonate, norm, 55 and 110 gal drs, delv lb.	...	.35	...	.35	...	.35
Lactate lb.	...	.26½	...	.26½	...	.23½
Oleate, drs, frt all'd lb.	...	.25	...	.25	...	.25
Propionate, drs lb.	.16½	.17	.16½	.17	.16½	.17
tks, delv lb.	...	.15½	...	.15½	...	.15½
Stearate, 50 gal drs lb.	...	.31	...	.31	.28½	.32½
Tartrate, drs lb.	no prices		no prices		.55	.60
Butyraldehyde, drs, lcl, wks lb.	...	.35½	...	.35½	...	.35½
C						
Cadmium Metal lb.	.90	.95	.90	.95	.80	.95
Sulfide, orange, boxes lb.	...	1.10	...	1.10	...	1.10
Calcium, Acetate, 150 lb bgs c-l, delv 100 lb.	3.00	4.00	3.00	4.00	1.90	4.00
Arsenate, c-l, E of Rockies, dealers, drs lb.	.06½	.07½	.06½	.07½	.06	.07½
Carbide, drs lb.	...	.04¾	...	.04¾	...	.04¾
Carbonate, tech, 100 lb bgs, c-l ton	16.00	20.00	16.00	20.00	16.00	20.00
Chloride, flake, 375 lb drs, burlap bgs, c-l, delv ton	...	21.00	...	21.00	...	20.50
paper bgs, c-l, delv ton	18.50	41.00	18.50	41.00	18.50	35.00
Solid, 650 lb drs, c-l, delv ton	18.00	34.50	18.00	34.50	18.00	34.50
Ferrocyanide, 350 lb bbls wks lb.	...	.20	...	.20	...	.20
Gluconate, Pharm, 125 lb bbls lb.	.52	.59	.52	.59	.52	.59
Levulinate, less than 25 bbl lots, wks lo.	...	3.00	...	3.00	...	3.00
Nitrate, 100 lb bgs ton	no prices		no prices		no prices	
Palmitate, bbls lb.	.28	.29	.28	.29	.22	.29
Phosphate, tribasic, tech, 450 lb bbls lb.	.0635	.0705	.0635	.0705	.0635	.0705
Resinate, precip, bbls lb.	.13	.14	.13	.14	.13	.14
Stearate, 100 lb bbls lb.	.26	.27	.26	.27	.20½	.27
Camphor, slabs lb.	1.60	1.65	1.60	1.65	.73	1.65
Powder lb.	1.60	1.65	1.60	1.65	.63	1.65
Carbon Bisulfide, 500 lb drs lb.	.05	.05¾	.05	.05¾	.05	.05¾
Black, c-l, bgs, f.o.b. plants lb.	...	.03625	...	.03625	.03325	.0342
Decolorizing, drs, c-l lb.	.08	.15	.08	.15	.08	.15
Dioxide, Liq, 20-25 lb cyl lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, (*FP*), 55 or 110 gal drs, c-l, delv lb.	...	.73	...	.73	.66½	.73
Casein, Standard, Dom, grd lb.	.30	.30½	.30	.30½	.11½	.31
80-100 mesh, c-l bgs lb.	.30½	.31	.30½	.31	.12	.31½
Castor Pomace, 5½ NH_3, c-l, bgs, wks ton	...	16.00	...	16.00	15.00	16.00
Imported, ship, bgs ton	no prices		no prices		no prices	
Celluloid, Scraps, ivory cs lb.	.13	.15	.13	.15	.12	.15
Transparent, cs lb.	...	.20	...	.20	...	.20
Cellulose, Acetate, frt all'd, 50 lb kgs lb.	...	.30	...	.30	...	.30
Triacetate, flake, frt all'd lb.	...	.30	...	.30	...	.30
Chalk, dropped, 175 lb bbls lb.	...	.02⅞	...	.02⅞	.02¾	.02⅞
Precip, heavy, 560 lb cks 100 lbs.	...	32.50	32.50	32.50	32.50	32.50
Charcoal, Hardwood, lump, blk, wks bu.	...	.15	...	.15	...	.15
Softwood, bgs, delv* ton	25.00	36.00	25.00	36.00	25.00	36.00
Willow, powd, 100 lb bbls, wks lb.	.06	.07	.06	.07	.06	.07
Chestnut, clarified tks, wks lb.	...	.0225	...	.0225	.01¾	.0275
25%, bbls, wks lb.	...	.0275	...	.0275	.0240	.0275
China Clay, c-l, blk mines ton	...	7.60	...	7.60	...	7.60
Imported, lump, blk ton	18.60	23.00	18.60	23.00	18.60	...
Chlorine, cyls, lcl, wks, contract (*FP*) lb.	...	.07¼	...	.07¼	...	.07¼
cyls, c-l, contract lb. *j*	...	.05¼	...	.05¼	...	.05¼

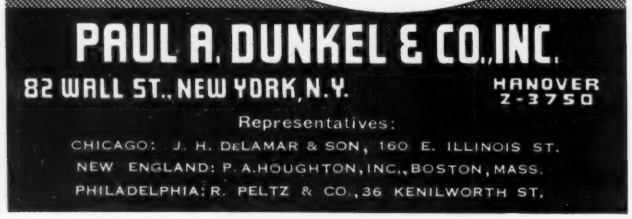
j A delivered price; * Depends upon point of delivery.
(*FP*) Full Priority.

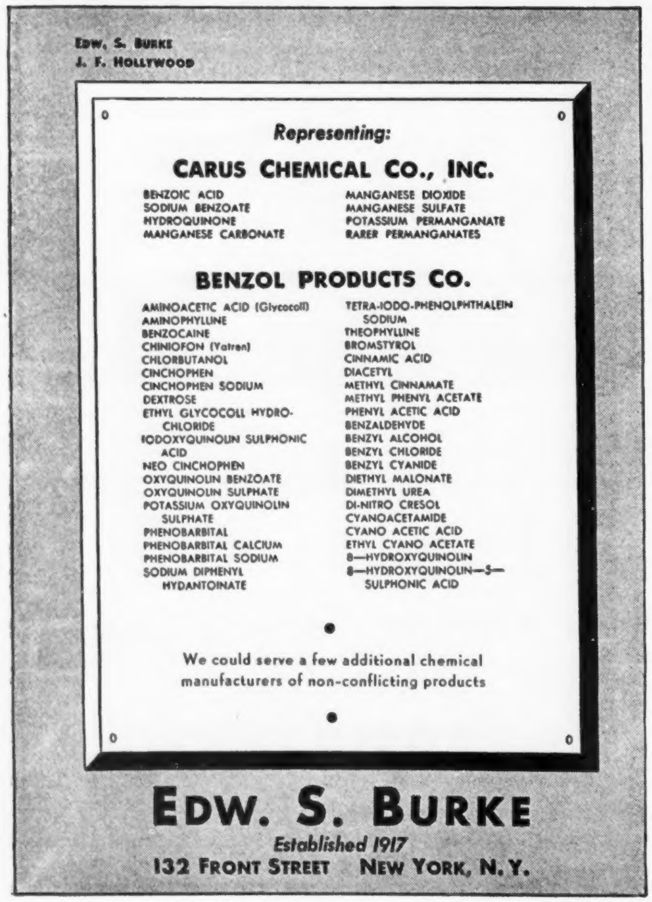
	Current Market		1942 Low	1942 High	1941 Low	1941 High
Chlorine (continued):						
Liq, tk, wks, contract 100 lb.	...	1.75	...	1.75	...	1.75
Multi, c-l, cyls, wks, cont lb.	...	2.00	...	2.00	1.90	2.00
Chloroacetophenone, tins, wks lb.	3.00	3.50	3.00	3.50	3.00	3.50
Chlorobenzene, Mono, 100 lb. drs, lcl, wks lb.	...	.08	...	.08	.06	.08
Chloroform, tech, 650 lb drs lb.	...	.20	...	.20	...	.20
USP, 650 lb drs lb.	...	.30	...	.30	...	.30
Chloropicrin, comml cyls lb.	...	.80	...	.80	...	.80
Chrome, Green, CP lb.	.23	.33	.23	.33	.21	.25
Yellow lb.	.16	.17	.16	.17	.13½	.14½
Chromium Acetate, 8% Chrome, bbls lb.	.07¾	.08½	.07¾	.08½	.07¾	.08½
Fluoride, powd, 400 lb bbls lb.	.27	.28	.27	.28	.27	.28
Coal tar, bbls bbl.	7.50	7.75	7.50	7.75	7.50	7.75
Cobalt Acetate, bbls (A) lb.	...	.83¾	...	.83¾	.80½	.83¾
Carbonate tech, bbls (A) lb.	...	1.58	...	1.58	...	1.58
Hydrate, bbls (A) lb.	...	2.04	...	2.04	1.98	2.04
Linoleate, solid, bbls lb.	...	.42	...	.42	.33	.42
paste, 5%, drs lb.	...	.31	...	.31	...	.31
Oxide, black, bgs (A) lb.	...	1.84	...	1.84	...	1.84
Resinate, fused, bbls lb.	...	.13½	...	.13½	...	.13½
Precipitated, bbls lb.	...	.34	...	.34	...	.34
Cochineal, gray or bk bgs lb.	.37	.38	.37	.38	.37	.38
Teneriffe silver, bgs lb.	.38	.39	.38	.39	.38	.39
Copper, metal *FP*, *PC* 100 lb.	12.00	12.50	12.00	12.50	12.00	12.50
Acetate, normal, bbls, delv lb.	.24	.26	.24	.26	.22	.26
Carbonate, 52-54% 400 lb bbls lb.	.18	.20½	.18	.20½	.1650	.20½
Chloride, 250 lb bbls lb.	...	.20½	.19½	.20½	.16	.19½
Cyanide, 100 lb drs lb.	.34	.38	.34	.38	.34	.38
Oleate, precip, bbls lb.	...	.20	...	.20	...	.20
Oxide, black, bbls, wks lb.	.19½	.21	.19½	.21	.18	.21
red 100 lb bbls lb.	.20	.22	.20	.22	.19	.22
Sub-acetate verdigris, 400 lb bbls lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls, c-l, wks, 100 lb.	5.15	5.50	5.15	5.50	4.75	5.50
Copperas crys and sugar bulk c-l, wks ton	...	17.00	...	17.00	14.00	17.00
Corn sugar, tanners, bbls 100 lb.	...	3.59	3.59	4.05	3.36	4.05
Corn Syrup, 42°, bbls 100 lb.	...	3.52	...	3.52	3.42	3.52
43°, bbls 100 lb.	...	3.57	...	3.57	3.47	3.57
Cotton, Soluble, wet 100 lb bbls lb.	.40	.42	.40	.42	.40	.42
Cream Tartar, powd & gran 300 lb bbls lb.	...	.57½	...	.57½	.38¼	.57½
Creosote, USP 42 lb cbys lb.	.60	.77	.60	.77	.45	.77
Oil, Grade 1 tks gal.	...	.15½	...	.15½	.13½	.15½
Grade 2 gal.	.122	.132	.122	.132	.122	.132
Cresol, USP, drs, c-l lb.	.11	.11¼	.11	.11¼	.09¾	.11¼
Crotonaldehyde, 97%, 55 and 110 gal drs, wks lb.	...	.15	...	.15	.11	.15
Cutch, Philippine, 100 lb bale lb	...	.05¼	...	.05¼	.04¾	.05¼
Cyanamid, pulv, bgs, c-l, frt all'd, nitrogen basis, unit	no prices		no prices		...	1.40

D

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Derris root 5% rotenone, bbls lb.	.40	.41	.40	.41	.21	.40
Dextrin, corn, 140 lb bgs f.o.b., Chicago 100 lb.	...	4.00	...	4.00	3.80	4.00
British Gum, bgs 100 lb.	...	4.25	...	4.25	4.05	4.25
Potato, Yellow, 220 lb bgs lb.	...	.09½	...	.09½	.08	.08½
White, 220 lb bgs, lcl lb.	.09½	.11¾	.09½	.11¾	.08½	.09
Tapioca, 200 bgs, lcl lb.	...	.0715	...	.0715	...	.0715
White, 140 lb bgs 100 lb.	...	3.95	...	3.95	3.75	3.95
Diamylamine, c-l, drs, wks lb.	...	.61	.50	.61	.47	.50
lcl drs, wks lb.	...	.64	.53	.64	.48	.53
Diamylene, drs, wks lb.	...	.105	...	.105	.095	.105
lcl, drs lb.	...	.112	...	.112	...	...
tks, wks lb.	...	.09½	...	.09½	.08½	.09½
Diamylether lb.	...	...	...	...	.085	.102
lcl, drs lb.	...	.102	...	.102	...	...
c-l, drs lb.	...	.095	...	.095	...	...
tks lb.	...	.085	...	.085	...	...
Diamylnaphthalene, lcl, drs, f.o.b. wks lb.	...	.17	...	.17	.17	.20
Diamylphenol, lcl, drs lb.	...	.21	...	.21	...	...
Diamylphthalate, drs, wks lb.	.21	.21½	.21	.21½	.21	.21½
Diamyl Sulfide, drs, lcl lb.	...	.25	...	.25	...	...
Diatomaceous Earth, see Kieselguhr.						
Dibutoxy Ethyl Phthalate, drs, wks lb.	...	.35	...	.35	...	.35
Dibutylamine, lcl, drs, wks lb.	...	.64	.53	.64	...	.53
c-l, drs, wks lb.	...	.61	.50	.61	...	.50
tks, wks lb.	...	.48	...	.48	...	.48
Dibutyl Ether, drs, wks, lcl lb.	.26	.28	.26	.28	.25	.28
Dibutylphthalate, drs, wks, frt all'd lb.	.21	.23	.21	.23	.19	.20
Dibutyltartrate, 50 gal drs lb.	...	.87	...	.87	.50	.87
Dichlorethylene, drs lb.	...	.25	...	.25	...	.25
Dichloroethylether, 50 gal drs, wks lb.	.15	.16	.15	.16	.15	.16
tks, wks lb.	...	.14	...	.14	...	.14
Dichloromethane, drs, wks lb.	...	.23	...	.23	...	.23
Dichloropentanes, c-l, drs lb.	...	.037	...	.037	.025	.04
lcl, drs lb.	...	.045	...	.045	...	...
tks, wks lb.	...	.03	...	.03	.0221	.025
Diethanolamine, tks, wks lb.	...	.22½	...	.22½	...	.22½
Diethylamine, 300 lb drs, lcl, f.o.b., wks lb.	...	.81	.70	.81	...	.70

* These prices were on a delivered basis.





	Current	Market	1942 Low	1942 High	1941 Low	1941 High
Diethylamino Ethanol, lcl, drs, f.o.b. Wyandotte, frt all'd E. Miss ....lb.	...	.85	.75	.85	...	.75
Diethylaniline, 850 lb drs lb.	...	.40	...	.40	...	.40
Diethylcarbonate, com drs lb.	...	.25	...	.25	...	.25
Diethylorthotoluidin, drs .lb.	.64	.67	.64	.67	.64	.67
Diethylphthalate, c-l, drs ..lb.	...	.21½	...	.21½	.19	.20
Diethylsulfate, tech, drs, wks, lcl ....lb.	.13	.14	.13	.14	.13	.14
Diethyleneglycol, drs ....lb.	.14	.15½	.14	.15½	.14	.15½
Mono ethyl ether, drs ..lb.	.14½	.15½	.14½	.15½	.14½	.15½
tks, wks ....lb.	...	.13½	...	.13½	...	.13½
Mono butyl ether, drs ..lb.	.22½	.24½	.22½	.24½	.22½	.24½
tks, wks .... lb.	...	.22	...	.22	...	.22
Diethylene oxide, 50 gal drs, wks ....lb.	.20	.24	.20	.24	.20	.24
Diglycol Laurate, bbls ...lb.	...	.16	...	.16	...	.16
Oleate, bbls ....lb.	...	.17	...	.17	...	.17
Stearate, bbls ....lb.	...	.22	...	.22	...	.22
Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis ....lb.	.85	.90	.85	.90	.85	1.05
Dimethylaniline, 240 lb drs lb.	.23	.24	.23	.24	.23	.24
Dimethyl phthalate, drs, wks, frt all'd lb.	...	.20	...	.20	.18½	.20
Dimethylsulfate, 100 lb drs lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls lb.	...	.18	...	.18	...	.18
Dinitrochlorobenzene, 400 lb bbls .... lb.	...	.14	...	.14	...	.14
Dinitronaphthalene, 350 lb bbls .... lb.	.35	.38	.35	.38	.35	.38
Dinitrophenol, 350 lb bbls lb.	...	.22	...	.22	...	.22
Dinitrotoluene, 300 lb bbls lb.	...	.18	...	.18	.15½	.18
Diphenyl, bbls .... lb.	...	.15	...	.15	.15	.20
Diphenylamine ....lb.	...	.25	...	.25	...	.25
Diphenylguanidine, 100 lb drs .... lb.	.35	.37	.35	.37	.35	.37
Dip Oil, see Tar Acid Oil.						
Divi Divi pods, bgs shipmt ton	55.00	60.00	55.00	60.00	32.00	52.00
Extract ....lb.	.05¾	.06¾	.05¾	.06¾	.05¾	.06¾
Drymet (see sodium metasilicate anhydrous).						
E						
Egg Yolk, dom., 200 lb. cases lb.	1.00	1.05	1.00	1.05	.60	1.05
Epsom Salt, tech, 300 lb bbls c-l, NY .....100 lb.	...	1.90	...	1.90	...	1.90
USP, c-l, bbls .....100 lb.	...	2.10	...	2.10	...	2.10
Ether, USP anaesthesia 55 lb drs ....lb.	.52	.53	.52	.53	.26	.53
Isopropyl 50 gal drs ...lb.	.07	.08	.07	.08	.07	.08
tks, frt all'd ....lb.	...	.06	...	.06	...	.06
Nitrous conc bottles ...lb.	...	.73	...	.73	...	.73
Synthetic, wks, tks .....lb.	...	.08	...	.08	.08	.09
Ethyl Acetate, 85% Ester tks, frt all'd ....lb.	.11	.12	.11	.12	.06½	.12
drs, frt all'd ....lb.	.12	.13	.12	.13	.07½	.13
99%, tks, frt all'd ...lb.	...	.12¼	...	.12¼	.06¾	.12¼
drs, frt all'd .... lb.	...	.13¼	...	.13¼	.07¾	.13¼
Acetoacetate, 110 gal drs lb.	...	.37½	...	.37½	.27½	.37½
Benzylaniline, 300 lb drs lb.	.86	.88	.86	.88	.86	.88
Bromide, tech drs .....lb.	.50	.55	.50	.55	.50	.55
Cellulose, drs, wks, frt all'd ....lb.	.50	.60	.50	.60	.45	.50
Chloride, 200 lb drs ....lb.	.18	.20	.18	.20	.18	.20
Chlorocarbonate, cbys ..lb.	...	.30	...	.30	...	.30
Crotonate, drs ....lb.	...	.35	...	.35	...	.35
Formate, drs, frt all'd ..lb.	...	.27¾	...	.27¾	.25	.27¾
Lactate, drs, wks ....lb.	...	.33½	...	.33½	...	.33½
Oxalate, drs, wks ....lb.	...	.33	...	.33	.25	.33
Silicate, drs, wks ....lb.	...	.77	...	.77	...	.77
Ethylene Dibromide, 60 lb drs ....lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys chloro, cont ....lb.	.75	.85	.75	.85	.75	.85
Anhydrous .... lb.	...	.75	...	.75	...	.75
Dichloride, (*FP*) 50 gal drs, E. Rockies .... lb.	...	.0742	...	.0742	.0693	.0746
Glycol, 50 gal drs, wks..lb.	.14½	.18½	.14½	.18½	.14½	.18½
tks, wks ....lb.	...	.13½	...	.13½	...	.13½
Mono Butyl Ether, drs, wks ....lb.	.16½	.17½	.16½	.17½	.16½	.17½
tks, wks ....lb.	...	.15½	...	.15½	...	.15½
Mono Ethyl Ether, drs wks ....lb.	.14½	.15½	.14½	.15½	.14½	.15½
tks, wks ....lb.	...	.13½	...	.13½	...	.13½
Mono Ethyl Ether Acetate, drs, wks .....lb.	.11½	.12½	.11½	.12½	.11½	.12½
tks, wks ....lb.	...	.10½	...	.10½	...	.10½
Mono Methyl Ether, drs wks ....lb.	.15½	.16½	.15½	.16½	.15½	.16½
tks, wks ....lb.	...	.14½	...	.14½	...	.14½
Oxide, cyl ....lb.	.50	.55	.50	.55	.50	.55
Ethylideneaniline ....lb.	.45	.47½	.45	.47½	.45	.47½
F						
Feldspar, blk pottery ....ton	...	19.00	...	19.00	17.00	19.00
Powd. blk wks ....ton	14.00	17.50	14.00	17.50	14.00	17.50
Ferric Chloride, tech, crys, **475 lb bbls ....lb.**	.05	.07½	.05	.07½	.05	.07½
sol, 42° cbys ....lb.	.06½	.07	.06½	.07	.06½	.07

l + 10; *m* + 50; * Bbls. are 20c higher.
FP Full Priority. *PC* Price Ceiling.

		Current Market		1942 Low	1942 High	1941 Low	1941 High
Fish Scrap, dried, unground wks	unit *l*	...	4.85	4.75	4.85	4.35	4.85
Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis	unit *m*	...	3.25	2.75	3.25	2.75	3.25
Fluorspar, 98% bgs	ton	32.00	34.00	32.00	34.00	29.00	34.00
Formaldehyde, c-l, bbls, wks (*FP, PC*)	lb.	.055	.0575	.055	.0575	...	...
Fossil Flour	lb.	.02½	.04	.02½	.04	.02½	.04¼
Fullers Earth, blk, mines	ton	8.50	15.00	8.50	15.00	8.50	15.00
Imp powd, c-l, bgs	ton	30.00	40.00	30.00	40.00	no prices	
Furfural (tech) drs, wks	lb.	...	.15	...	.15	.10	.15
tks, wks	lb.	...	.09	...	.09	...	.09
Furfuramide (tech) 100 lb drs	lb.	...	.30	...	.30	...	.30
Fusel Oil, 10% impurities	lb.	.18	.18½	.18	.18½	.16	.19½
Fustic, crystals, 100 lb boxes	lb.	.28	.32	.28	.32	.24	.32
Liquid 50°, 600 lb bbls	lb.	.12½	.16	.12½	.16	.10½	.16
Solid, 50 lb boxes	lb.	.19	.21	.19	.21	.19	.21
G							
G Salt paste, 360 lb bbls	lb.	...	.45	...	.45	...	.45
Gambier, com 200 lb bgs	lb.	no prices		...	.09½	.06½	.09½
Singapore cubes, 150 lb bgs	100 lb.	.13	nom.	.12½	.13	.08¼	.11
Glauber's Salt, tech, c-l, bgs, wks*	100 lb.	1.05	1.28	1.05	1.28	.95	1.28
Anhydrous, see Sodium Sulfate							
Glue, bone, com grades, c-l bgs	lb.	.15½	.18½	.15½	.18½	.13½	.18½
Better grades, c-l, bgs	lb.	.19	.30	.19	.30	.15	.30
Glycerin (*PC*) CP, drs	lb.	...	.18¼	...	.18¼	.14½	.19½
Dynamite, 100 lb drs	lb.	...	.18¼	...	.18¼	...	.18¼
Saponification, drs	lb.	...	.12¾	...	.12¾	.09½	.20½
Soap Lye, drs	lb.	...	.11½	...	.11½	.07⅛	.18
Glyceryl Bori-Borate, bbls	lb.	...	.40	...	.40	...	.40
Monoricinoleate, bbls	lb.	...	.27	...	.27	...	.27
Monostearate, bbls	lb.	...	.30	...	.30	...	.30
Oleate, bbls	lb.	...	.22	...	.22	...	.22
Phthalate	lb.	...	.38	...	.38	...	.38
Glyceryl Stearate, bbls	lb.	...	.18	...	.18	...	.18
Glycol Bori-Borate, bbls	lb.	...	.22	...	.22	...	.22
Phthalate, drs	lb.	...	.38	...	.38	...	.38
Stearate, drs	lb.	...	.26	...	.26	...	.26
GUMS							
Gum Aloes, Barbadoes	lb.	.80	.85	.80	.85	.80	.95
Arabic, amber sorts	lb.	.22	.24	.22	.24	.14	.25
White sorts, No. 1, bgs	lb.	.33	.35	.33	.35	.35	.45
Powd, bbls	lb.	.26	.28	.26	.28	.18	.30
Asphaltum, Barbadoes (Manjak) 200 lb bgs, f.o.b. NY	lb.	.04½	.05½	.04½	.05½	.04½	.05½
California, f.o.b. NY, drs	ton	20.00	36.50	20.00	36.50	20.00	36.50
Egyptian, 200 lb cases, f.o.b. NY	lb.	.12	.15	.12	.15	.12	.15
Benzoin Sumatra, USP, 120 lb cases	lb.	.45	.50	.45	.50	.19	.50
Copal, Congo, 112 lb bgs, clean, opaque	lb.	...	.49½	...	.49½	...	.49½
Dark amber	lb.	...	.12¾	...	.12¾	...	.12¾
Light amber	lb.	...	.17	...	.17	...	.17
Copal, East India, 180 lb bgs							
Macassar pale bold	lb.	...	.17⅜	...	.17⅜	.12¾	.17⅜
Chips	lb.	...	.11½	...	.11½	.06¾	.11½
Dust	lb.	...	.07	...	.07	.05¼	.07
Nubs	lb.	...	.13⅜	...	.13⅜	.10½	.13⅜
Singapore, Bold	lb.	...	.22⅜	...	.22⅜	.15¾	.22⅜
Chips	lb.	...	.12⅜	...	.12⅜	.08½	.12⅜
Dust	lb.	...	.07	...	.07	.05¼	.07
Nubs	lb.	...	.17¾	...	.17¾	.11	.17¾
Copal Manila, 180-190 lb		...	.14	...	.14	.13⅞	.14
Loba B	lb.	...	.14¼	...	.14¼	.11¾	.14¼
Loba C	lb.	...	.13⅞	...	.13⅞	.11¼	.13⅞
DBB	lb.	...	.12¼	...	.12¼	.10	.12¼
MA sorts	lb.	...	.10¼	...	.10¼	.07¾	.10¼
Copal Pontianak, 224 lb cases, bold genuine	lb.	...	.22⅞	...	.22⅞	.15⅜	.22⅞
Chips	lb.	...	.14½	...	.14½	.10	.14½
Mixed	lb.	...	.17⅞	...	.17⅞	.14⅜	.17⅞
Nubs	lb.	...	.18⅞	...	.18⅞	.12¾	.18⅞
Split	lb.	...	.19⅝	...	.19⅝	.13¾	.19⅝
Damar Batavia, 136 lb cases							
A	lb.	...	.35¾	...	.35¾	.21⅝	.35¾
B	lb.	...	.34⅜	...	.34⅜	.20¼	.34⅜
C	lb.	...	.28⅝	...	.28⅝	.14⅝	.28⅝
D	lb.	...	.25⅝	...	.25⅝	.13¼	.25⅝
A/D	lb.	...	.28⅜	...	.28⅜	.15¼	.28⅜
A/E	lb.	...	.25⅝	...	.25⅝	.12⅞	.25⅝
E	lb.	...	.18¾	...	.18¾	.10	.18¾
F	lb.	...	.13¾	...	.13¾	.08	.13¾
Singapore, No. 1	lb.	...	.30⅝	...	.30⅝	.16⅝	.30⅝
No. 2	lb.	...	.25⅜	...	.25⅜	.12¼	.25⅜
No. 3	lb.	...	.12⅜	...	.12⅜	.07⅛	.12⅜
Chips	lb.	...	.23½	...	.23½	.11	.23½
Dust	lb.	...	.13	...	.13	.07⅛	.13
Seeds	lb.	...	.17¾	...	.17¾	.09⅞	.17¾
Elemi, cns, c-l	lb.	...	.08⅞	...	.08⅞	.08½	.08⅞
Ester	lb.	.08½	.09½	.08½	.09½	.06¼	.09½
Gamboge, pipe, cases	lb.	.95	1.00	.95	1.00	.95	1.00
Powd, bbls	lb.	1.05	1.10	1.05	1.10	1.05	1.10
Ghatti, sol, bgs	lb.	.11	.15	.11	.15	.11	.15
Karaya, bbls, bxs, drs	lb.	.14	.33	.14	.33	.14	.33

FP Full Priority. *PC* Price Ceiling.

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Kauri, NY						
Brown XXX, cases .... lb.	...	.60	...	.60	...	.60
BX .... lb.	...	.38	...	.38	...	.38
B1 .... lb.	...	.28	...	.28	...	.28
B2 .... lb.	...	.24	...	.24	...	.24
B3 .... lb.	...	.18½	...	.18½	...	.18½
Pale XXX .... lb.	...	.61	...	.61	...	.61
No. 1 .... lb.	...	.41	...	.41	...	.41
No. 2 .... lb.	...	.24	...	.24	...	.24
No. 3 .... lb.	...	.17¾	...	.17¾	...	.17¾
Kino, tins .... lb.	no prices		no prices		no prices	
Mastic .... lb.	3.25	3.30	3.25	3.30	1.50	3.30
Sandarac, prime quality, 200 lb bgs & 300 lb cks .. lb.	1.00	1.10	1.00	1.10	.50	1.10
Senegal, picked bgs ...... lb.	...	.30	...	.30	...	.30
Sorts .... lb.	...	.13	...	.13	...	.13
Thus, bbls .... 280 lbs.	...	16.50	...	16.50	15.00	16.50
Tragacanth, No. 1, cases .. lb.	3.50	3.60	3.50	3.60	2.75	3.40
No. 2 .... lb.	2.00	3.00	2.00	3.00	2.45	2.80
No. 3 .... lb.	1.10	1.20	1.10	1.20	1.10	2.60
Yacca, bgs .... lb.	.06½	.07¾	.06½	.07¾	.03½	.07¾
H						
Hematine crys, 400 lb bbls lb.	.24	.34	.24	.34	.20	.34
Hemlock, 25%, 600 lb bbls						
wks .... lb.	nom.	.03½	nom.	.03½	.03⅛	.03½
tks .... lb.	nom.	.03	nom.	.03	.02¾	.03
Hexalene, 50 gal drs, wks lb.	...	.23	...	.23	.23	.30
Hexane, normal 60-70° C. Group 3, tks ...... gal.	...	.11	...	.11	.09¾	.11
Hexamethylenetetramine, powd, drs (*FP*) ..... lb.	.32	.33	.32	.33	.32	.33
Hexyl Acetate, secondary,						
delv, drs .... lb.	.13	.13½	.13	.13½	.13	.13½
tks .... lb.	...	.12	...	.12	...	.12
Hoof Meal, f.o.b. Chicago unit	3.50	4.00	3.00	4.00	2.65	3.05
Hydrogen Peroxide, 100 vol, 140 lb cbys .... lb.	.16	.18½	.16	.18½	.16	.18½
Hydroxylamine Hydrochloride .... lb.	...	3.15	...	3.15	..	3.15
Hypernic, Bags, No. 1 ... lb.	...	.42	...	.42	.40	.42
I						
Indigo, Bengal, bbls ..... lb.	2.14	2.20	2.14	2.20	1.63	2.20
Synthetic, liquid ...... lb.	.16½	.19	.16½	.19	.16½	.19
Iodine, Resublimed, jars .. lb.	...	2.00	...	2.00	...	2.00
Irish Moss, ord, bales ... lb.	.30	.31	.30	.31	.25	.31
Bleached, prime, bales .. lb.	.80	.85	.80	.85	.32	.46
Iron Acetate Liq. 17°, bbls delv .... lb.	.03	.04	.03	.04	.03	.04
Chloride see Ferric Chloride						
Nitrate, coml, bbls .. 100 lb.	3.50	4.00	3.50	4.00	3.50	4.00
Isobutyl Carbinol (128-132°C)						
drs, frt all'd .... lb.	...	.23½	...	.23½	.22½	.23½
tks, frt all'd .... lb.	...	.21½	...	.21½	...	.21½
Isopropyl Acetate, tks, frt all'd .... lb.	...	.076	...	.076	.06½	.07½
drs, frt all'd, c-l ..... lb.	...	.086	...	.086	.07½	.08½
Ether, see Ether, isopropyl						
K						
Keiselguhr, dom bags, c-l, Pacific Coast .... ton	22.00	25.00	22.00	25.00	22.00	25.00
L						
Lead Acetate, f.o.b. NY, bbls,						
White, broken .... lb.	.12	.12½	.12	.12½	.11	.12½
cryst, bbls .... lb.	.12	.12½	.12	.12½	.11	.12½
gran, bbls .... lb.	.12¾	.13¼	.12¾	.13¼	.11¾	.13¼
powd, bbls .... lb.	.12¾	.13¼	.12¾	.13¼	.11¾	.13¼
Arsenate, East, drs .... lb.	.11	.12	.11	.12	.09	.11
Linoleate, solid, bbls ... lb.	...	.19	...	.19	...	.19
Metal, c-l, NY (*FP*) 100 lb.	5.85	5.90	5.85	5.90	5.70	5.90
Nitrate, 500 lb bbls, wks lb.	.11	.14	.11	.14	.11	.14
Oleate, bbls .... lb.	.18½	.20	.18½	.20	.18½	.20
Red, dry, 95% Pb_3O_4, delv .... lb.	...	.09	...	.09	.08	.08¾
97% Pb_3O_4, delv .... lb.	...	.09¼	...	.09¼	.084	.086
98% Pb_3O_4, delv .... lb.	...	.09½	...	.09½	.0865	.0885
Resinate, fused, bbls ... lb.	...	.09½	...	.09½	.09½	.16½
Stearate, bbls .... lb.	...	.25	...	.25	...	.25
Titanate, bbls, c-l, f.o.b. wks, frt all'd .... lb.	...	.10¼	...	.10¼	...	.10¼
White, 500 lb bbls, wks, lb.	...	.07½	...	.07½	...	.07½
Basic sulfate, 500 lb bbls, wks .... lb.	...	.06314	...	.06314	.06½	.07
Lime, chemical quicklime, f.o.b. wks, bulk ..... ton	7.00	13.00	7.00	13.00	7.00	13.00
Hydrated, f.o.b. wks .. ton	8.50	16.00	8.50	16.00	8.50	16.00
Lime Salts, see Calcium Salts						
Lime, sulfur, dealers, tks gal.	.07½	.08½	.07½	.08½	...	.07½
drs .... gal.	.10	.14	.10	.14	.10	.14
Linseed Meal, bgs ...... ton	...	34.00	...	34.00	23.00	33.00
Litharge, coml, delv, bbls lb.	...	.0790	...	.0790	.07	.0760
Lithopone, dom, ordinary,						
delv, bgs .... lb.	...	.04¼	...	.04¼	.0385	.04¼
bbls .... lb.	...	.04½	...	.04½	.041	.04½
Titanated, bgs .... lb.	...	.056	...	.056	.05¼	.056
bbls .... lb.	...	.0585	...	.0585	.05½	.0585
Logwood, 51°, 600 lb bbls lb.	...	.13	...	.13	.10½	.13
Solid, 50 lb boxes ...... lb.	...	.22	...	.22	.16½	.22

(*FP*) Full Priority.

	Current Market		1942 Low	1942 High	1941 Low	1941 High
M						
Madder, Dutch ....lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbls ton	74.00	80.00	74.00	80.00	65.00	80.00
Magnesium Carb, tech, 70 lb bgs, wks ....lb.	...	.06¼	...	.06¼	...	.06¼
Chloride flake, 375 lb bbls, c-l, wks ....ton	...	32.00	...	32.00	...	32.00
Metal Ingots, c-l ....lb.	...	.27	...	.27	...	...
Oxide, calc tech, heavy bbls, frt all'd ....lb.	...	.26	...	.26	...	.26
Light bbls above basis lb.	...	.26	...	.26	...	.26
USP Heavy, bbls, above basis ....lb.	...	.26	...	.26	...	.26
Palmitate, bbls ....lb.	.33	.35	.33	.35	.33	.35
Silicofluoride, bbls ....lb.	.20	.25	.20	.25	.11	.25
Stearate, bbls ....lb.	.31	.33	.31	.33	.23	.31
Manganese, acetate, drs ..lb.	...	.26½	...	.26½	...	.26½
Borate, 30%, 200 lb bbls lb.	.15	.16	.15	.16	.15	.16
Chloride, bbls ....lb.	.14	nom.	.14	nom.	...	.14
Dioxide, tech (peroxide), paper bgs, c-l ....ton	...	70.00	...	70.00	...	71.50
Hydrate, bbls ....lb.	...	.82	...	.82	...	.82
Linoleate, liq. drs ....lb.	.18	.19½	.18	.19½	.18	.19½
solid, precip, bbls ....lb.	...	.19	...	.19	...	.19
Resinate, fused bbls ...lb.	.08¼	.08½	.08¼	.08½	.08¼	.08½
precip, drs ....lb.	...	.12	...	.12	...	.12
Sulfate, tech, anhyd, 90-95%, 550 lb drs ....lb.	.10½	.11½	.10½	.11½	.10½	.11½
Mangrove, 55%, 400 lb bbls lb.						
Bark, African ....ton	no prices		no prices		34.00	38.00
Mannitol, pure cryst, cs, wks lb.	...	.85	...	.85	.85	.90
commercial grd, 250 lb bbls ....lb.	...	.40	...	.40	.35	.45
Marble Flour, blk ....ton	12.50	14.50	12.50	14.50	12.00	14.50
Mercury chloride (Calomel) lb.	...	2.95	...	2.95	2.70	2.95
Mercury metal ..76 lb. flasks	203.00	210.00	203.00	210.00	167.00	215.00
Mesityl Oxide, f.o.b. dest, tks ....lb.	...	.10½	...	.10½	.10½	.15
drs, c-l ....lb.	...	.11½	...	.11½	.11½	.16
drs, lcl ....lb.	...	.12	...	.12	.12	.16½
Meta-nitro-aniline ....lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-paratoluidine 200 lb bbls ....lb.	1.05	1.10	1.05	1.10	1.05	1.10
Meta-phenylene diamine 300 lb bbls ....lb.	...	.65	...	.65	...	.65
Meta-toluene-diamine 300 lb bbls ....lb.	...	.70	...	.70	.65	.70
Methanol, denat, grd, drs, c-l frt all'd (*FP*) (*PC*) gal.	...	.66	...	.66	.60	.66
tks, frt all'd ....gal.	...	.60	...	.60	...	.60
Pure, nat, drs, c-l, frt all'd ....gal. *a*	.55½	.61½	.55½	.61½	.35½	.55½
tks, nat ....gal. *a*	.50	.54½	.50	.54½	.30	.50
Synth, pure, drs ....gal. *b*	.34½	.40½	.34½	.40½	...	...
tks, synth ....gal. *b*	.28	.32½	.28	.32½	...	...
Methyl Acetate, tech tks, delv ....lb.	.06	.07	.06	.07	.06	.07
55 gal drs, delv ......lb.	.11	.12½	.11	.12½	.07	.12½
C.P. 97-99%, tks, delv lb.	.09½	.10½	.09½	.10½	.09½	.10½
55 gal drs, delv ......lb.	.10½	.13	.10½	.13	.10½	.13
Acetone, frt all'd, drs gal. *p*	...	.81	...	.81	.37½	.81
tks, frt all'd ......gal. *p*	...	.75	...	.75	.32	.75
Synthetic, frt, all'd, drs ....gal. *p*	.51	.54½	.51	.54½	.37½	.51
tks, frt all'd ...gal.	.43	.45½	.43	.45½	.32	.43
Anthraquinone ....lb.	...	.83	...	.83	...	.83
Butyl Ketone, tks ......lb.	...	.10½	...	.10½	...	.10½
Cellulose, 100 lb. lots, frt all'd ....lb.	.50	.55	.50	.55	...	.55
less than 100 lbs. f.o.b. wks ....lb.	...	.60	...	.60	...	.60
Chloride, 90 lb. cyl ....lb.	.32	.40	.32	.40	.32	.40
Ethyl Ketone, tks, frt all'd lb.	...	.08	...	.08	.06	.08
50 gal drs, frt all'd, c-l lb.	...	.09½	...	.09½	.07	.09½
Formate, drs, frt all'd ..lb.	...	.89	...	.89	...	.89
Hexyl, Ketone, pure, drs lb.	...	.60	...	.60	...	.60
Lactate, drs, frt all'd ...lb.	...	.70	...	.70	.70	.80
Mica, dry grd, bgs, wks ..ton	...	30.00	...	30.00	...	30.00
Michler's Ketone, kgs ....lb.	...	2.50	...	2.50	...	2.50
Mixed Amylnaphthalenes mixed, ref., l-c-l, drs, f.o.b. wks ....lb.	...	.16	...	.16	.16	.19
crude ....lb.	...	.14	...	.14	.14	.15
Monoamylamine, c-l, drs, wks lb.	...	.61	.50	.61	.50	.52
lcl, drs, wks ....lb.	...	.64	...	.64	...	.55
Monoamylnaphthalene, l-c-l, drs, f.o.b. wks ....lb.	...	.17	...	.17	.17	.20
Monobutylamine, drs c-l, wks ....lb.	...	.48	.40	.48	...	.40
l-c-l, wks ....lb.	...	.51	.51	.64	...	.48
Monochlorobenzene, see "C"						
Monoethanolamine, tks, wks, lb.	...	.23	...	.23	...	.23
Monoethylamine (100% basis) lcl, drs, f.o.b. wks ......lb.	...	.46	...	.46	.35	.65
Monomethylamine, drs, frt all'd, E. Mississippi, c-l lb.	...	.65	...	.65	...	.65
Monomethylparamiosulfate, 100 lb drs ....lb.	3.75	4.00	3.75	4.00	3.75	4.00
Morpholine, drs 55 gal, wks ....lb.	...	.67	...	.67	...	.67

a Producers of natural methanol divided into two groups and prices vary for these two divisions; *b* Country is divided in 4 zones, prices varying by zone; *p* Country is divided into 4 zones.

(*FP*) Full Priority. (*PC*) Price Control.

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Myrobalans 25%, liq bbls lb.	no prices		no prices		no prices	
50% Solid, 50 lb boxes lb.	no prices		no prices		no prices	
J1 bgs ... ton	no prices		no prices		35.00	48.00
J2 bgs ... ton	no prices		no prices		28.00	39.00
N						
Naphtha, v.m.&p. (deodorized) see petroleum solvents.						
Naphtha, Solvent, water-white, tks ... gal.	...	.27	...	.27	...	.26
drs, c-l ... gal.	...	.31	...	.31	...	.31
Naphthalene, dom, crude bgs. wks ... lb.	2.50	2.75	2.50	2.75	2.25	2.75
Balls, flakes, pks ... lb.	...	.08	...	.08	.06¼	.08
Balls, ref'd bbls, wks ... lb.	...	.08	...	.08	.07	.08
Flakes, re'd, bbls, wks ... lb.	...	.08	...	.08	.07	.08
Nickel Carbonate, bbls ... lb.	.36	.36½	.36	.36½	.36	.36½
Chloride, bbls ... lb.	.18	.20	.18	.20	.18	.20
Metal ingot ... lb.	.35	.36	.35	.36	.34	.36
Oxide, 100 lb kgs, NY ... lb.	.35	.38	.35	.38	.35	.38
Salt, 400 lb bbls, NY ... lb.	.13	.13½	.13	.13½	.13	.13½
Nicotine, sulfate, 40%, drs, 55 lb drs ... lb.	...	.703	...	.703	...	.703
Nitre Cake, blk ... ton	...	16.00	...	16.00	...	16.00
Nitrobenzene redistilled, 1000 lb drs, wks ... lb.	.08	.09	.08	.09	.08	.09
tks ... lb.	...	.07	...	.07	...	.07
Nitrocellulose, c-l, lcl, wks lb.	.20	.29	.20	.29	.20	.29
Nitrogen Sol. 45½% ammon, f.o.b. Atlantic & Gulf ports, tks, unit ton, N basis	...	1.2158	...	1.2158	...	1.2158
Nitrogenous Mat'l, bgs imp unit	no prices		no prices		no prices	
dom, Eastern wks ... unit	...	3.50	2.75	3.50	2.20	3.00
dom, Western wks ... unit	...	3.35	2.60	3.35	1.75	2.60
Nitronaphthalene, 550 lb bbls lb.	.24	.25	.24	.25	.24	.25
Nutgalls Alleppo, bgs ... lb.	no prices		no prices		.26	.29
O						
Oak Bark Extract, 25%, bbls lb.	.03½	nom.	.03½	.03¾	.03⅛	.03¾
tks ... lb.	.02	nom.	...	.02	.02¾	.03
Octyl Acetate, tks, wks ... lb.	...	.15	...	.15	...	.15
Orange-Mineral, 1100 lb cks NY ... lb.	...	.12	...	.12	.11	.11½
Orthoaminophenol, 50 lb kgs lb.	2.15	2.25	2.15	2.25	2.15	2.25
Ortho amyl phenol, l-c-l, drs, f.o.b. wks ... lb.	...	.25	...	.25	.15	.25
Orthoanisidine, 100 lb drs lb.	...	.70	...	.70	...	.70
Orthochlorophenol, drs ... lb.	...	.32	...	.32	...	.32
Orthocresol, 30.4°, drs, wks lb.	.17	.17½	.17	.17½	.16	.17½
Orthodichlorobenzene, 1000 lb drs ... lb.	.06	.07½	.06	.07½	.06	.07½
Orthonitrochlorobenzene, 1200 lb drs, wks ... lb.	.15	.18	.15	.18	.15	.18
Orthonitroparachlorphenol, tins ... lb.	...	.75	...	.75	...	.75
Orthonitrophenol, 350 lb drs ... lb.	.85	.90	.85	.90	.85	.90
Orthonitrotoluene, 1000 lb drs, wks ... lb.	...	.09	...	.09	...	.09
Orthotoluidine, 350 lb bbls, lcl ... lb.	...	.19	...	.19	...	.19
Osage Orange, cryst, bbls lb.	...	.23	...	.23	.21	.23
51° liquid ... lb.	...	.10	...	.10	...	.10
P						
Paraffin, rfd, 200 lb bgs (*PC*)						
122-127° M P ... lb.	...	.052	...	.052	.04¼	.057
128-132° M P ... lb.	.056	.0585	.056	.0585	.057	.0595
133-137° M P ... lb.	.0615	.0640	.0615	.0640	.06¼	.06½
Para aldehyde, 99%, tech, 55-110 gal drs, wks ... lb.	...	.12	...	.12	.10	.12
Aminoacetanilid, 100 lb kgs ... lb.	...	.85	...	.85	...	.85
Aminohydrochloride, 100 lb kgs ... lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs lb.	...	1.05	...	1.05	...	1.05
Chlorophenol, drs ... lb.	...	.32	...	.32	...	.32
Dichlorobenzine 200 lb drs, wks ... lb.	.11	.12	.11	.12	.11	.12
Formaldehyde, drs, wks (*FP*) ... lb.	.23	.24	.23	.24	.23	.24
Nitroacetanilid, 300 lb bbls ... lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls, wks ... lb.	...	.45	...	.45	...	.45
Nitrochlorobenzene, 1200 lb drs, wks ... lb.	...	.15	...	.15	...	.15
Nitro-orthotoluidine, 300 lb bbls ... lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol, 185 lb bbls lb.	...	.35	...	.35	...	.35
Nitrosodimethylaniline, 120 lb bbls ... lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls lb.	...	.30	...	.30	...	.30
Pentaerythritol, tech, bbls, delv ... lb.	.33½	.35½	.33½	.35½	...	...
Phenylenediamine, 350 lb bbls ... lb.	1.25	1.30	1.25	1.30	1.25	1.30
Toluenesulfonamide, 175 lb. bbls ... lb.	...	.70	...	.70	...	.70
tks, wks ... lb.	...	.31	...	.31	...	.31
Toluenesulfonchloride, 410 lb bbls, wks ... lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls, wks ... lb.	...	.48	...	.48	...	.48

(*FP*) Full Priority. (*PC*) Price Control

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Paris Green, dealers, drs lb.	.24	.26	.24	.26	.23	.25
Pentane, normal, 28-38° C, group, 3 tks (*PC*) . . gal.	. . .	.08½	. . .	.08½	. . .	.08½
drs, group 3 . . . . gal.	.11½	.16	.11½	.16	.11½	.16
Perchlorethylene, 10 lb drs, frt all'd (*FP*) . . . . . . lb.	.08	.08½	.08	.08½	.08	.08½
Petrolatum, dark amber, bbls . . . . lb.	. . .	.03¾	. . .	.03¾	.02¾	.03½
White, lily, bbls . . . . . . lb.	. . .	.05¾	. . .	.05¾	.04¾	.05¾
White, snow, bbls . . . . . lb.	. . .	.06½	. . .	.06½	.05½	.06½
Petroleum Ether, 30-60°, group 3, tks . . . . gal.	. . .	.16	. . .	.16	.13½	.16
drs, group 3 . . . . gal.	. . .	.18	. . .	.18	.14½	.18

PETROLEUM SOLVENTS AND DILUENTS

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Cleaners naphthas, group 3, tks, wks . . . . gal.	. . .	.07⅛	. . .	.07⅛	.07	.07⅛
East Coast, tks, wks gal.	. . .	.10½	. . .	.10½	.10	.10½
Lacquer diluents, tks East Coast . . . . gal.	. . .	.11	. . .	.11	.09½	.11
Group 3, tks . . . . gal.	.07⅜	.08⅛	.07⅜	.08⅛	.06¼	.08⅛
Naphtha, V.M.P., East tks, wks . . . . gal.	. . .	.10½	. . .	.10½	.09	.11
Group 3, tks, wks . . . gal.	. . .	.07⅛	. . .	.07⅛	.06	.07⅛
Petroleum thinner, 43-47, East, tks, wks . . . . . . gal.	.08¾	.09½	.08¾	.09½	.08¾	.09½
Group 3, tks, wks . . . gal.	.06	.07	.06	.07	.05⅞	.07
Rubber Solvents, stand grd, East, tks, wks . . gal.	. . .	.10½	. . .	.10½	.09½	.10½
Group 3, tks, wks . . . gal.	. . .	.07⅛	. . .	.07⅛	.06	.07⅛
Stoddard Solvents, East, tks, wks . . . . gal.	. . .	.09½	. . .	.09½	.083	.09½
Group 3, wks . . . . . . gal.	. . .	.06⅝	. . .	.06⅝	.05½	.06⅝
Phenol, 250-100 lb drs . . . . lb.	.12½	.13	.12½	.13	.12	.13¾
tks, wks (*FP*) . . . . lb.	.11½	.12	.11½	.12	.11	.12
Phenyl-Alpha-Naphthylamine, 100 lb kgs . . . . lb.	. . .	1.35	. . .	1.35	. . .	1.35
Phenyl Chloride, drs . . . . . lb.	. . .	.17	. . .	.17	. . .	.17
Phenylhydrazine Hydrochloride, com . . . . lb.	. . .	1.75	. . .	1.75	. . .	1.50
Phloroglucinol, tech, tins . . lb.	15.00	16.50	15.00	16.50	15.00	16.50
CP, tons . . . . lb.	20.00	22.00	20.00	22.00	20.00	22.00
Phosphate Rock, f.o.b. mines 70% basis . . . . ton	. . .	2.40	. . .	2.40	2.15	2.40
72% basis . . . . ton	. . .	3.00	. . .	3.00	2.50	3.00
Florida Pebble, 68% basis ton	. . .	2.00	. . .	2.00	1.90	2.00
75-74% basis . . . . ton	. . .	4.00	. . .	4.00	. . .	2.90
Tennessee, 72% basis . . ton	. . .	5.00	. . .	5.00	4.50	5.00
Phosphorus Oxychloride 175 lb. cyl (*FP*) . . . . lb.	.15	.18	.15	.18	.15	.18
Red, 110 lb cases . . . . . lb.	.40	.44	.40	.44	.40	.44
Sesquisulfide, 100 lb cs . lb.	.38	.42	.38	.42	.38	.42
Trichloride, cyl . . . . lb.	.15	.16	.15	.16	.15	.16
Yellow, 110 lb cs, wks lb.	.18	.20	.18	.20	.18	.20
Phthalic Anhydride, 100 lb drs, wks . . . . lb.	.14½	.15½	.14½	.15½	.14½	.15½
Pine Oil, 55 gal drs or bbls Destructive dist . . . . lb.	. . .	.74	. . .	.74	.50	.65
Steam dist wat wh bbls gal.	. . .	1.10	. . .	1.10	.59	.68
Pitch Hardwood, wks . . . ton	23.75	24.00	23.75	24.00	23.75	24.00
Coaltar, bbls, wks . . . ton	19.00	22.00	19.00	22.00	19.00	22.00
Burgundy, dom, bbls, wks lb.	.06	.06½	.06	.06½	.06	.06½
Imported . . . . lb.	no prices		no prices		no prices	
Petroleum, see Asphaltum in Gums' Section.						
Pine, bbls . . . . bbl.	6.75	7.00	6.75	7.00	6.00	7.00
Polyamylnaphthalene, l-c-l, drs, f.o.b. wks . . . . lb.	. . .	.25	. . .	.25	.25	.30
Potash, Caustic, wks, sol . . lb	.06¼	.06¾	.06¼	.06¾	.06¼	.06¾
flake . . . . lb.	. . .	.07	. . .	.07	. . .	.07
liquid, tks . . . . lb.	. . .	.02⅞	. . .	.02⅞	. . .	.02⅞
Manure Salts, Dom 30% basis, blk . . . . . unit	. . .	.60	. . .	.60	. . .	.60

POTASSIUM

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Potassium Abietate, bbls . . lb.	. . .	.08	. . . .	.08	. . .	.08
Acetate, tech, bbls, delv lb.	. . .	.28	. . .	.28	.26	.28
Bicarbonate, USP, 320 lb bbls . . . . lb.	. . .	.14	. . .	.14	.14	.17
Bichromate Crystals, 725 lb csks *(*FP*) . . . . lb.	. . .	.09⅝	. . .	.09⅝	.08⅞	.09⅝
Binoxalate, 30 lb bbls . . lb.	. . .	.23	. . .	.23	. . .	.23
Bisulfate, 100 lb kgs . . . lb.	.15½	.18	.15½	.18	.15½	.18
Carbonate, 80-85% calc 800 lb cks . . . . lb.	.06½	.06¾	.06½	.06¾	.06½	.06¾
liquid, tks . . . . lb.	. . .	.0275	. . .	.0275	. . .	.0275
drs, wks . . . . lb.	.03	.03⅛	.03	.03⅛	.03	.03⅛
Chlorate crys, 112 lb kgs, wks (*FP*) . . . . lb.	nom.	.11	nom.	.11	. . .	.11
gran, kgs . . . . lb.	.12	.14½	.12	.14½	.12	.14½
powd, kgs . . . . lb.	.09¾	.10	.09¾	.10	.09½	.10
Chloride, crys, bbls . . . . lb.	.08	nom.	.08	nom.	.04	.08
Chromate, kgs (*FP*) . . . lb.	.24	.27	.24	.27	.24	.27
Cyanide, drs . . . . lb.	. . .	.55	. . .	.55	. . .	.55
Iodide, 250 lb bbls . . . . . lb.	1.44	1.38	1.44	1.38	1.35	1.38
Metabisulfite, 300 lb bbls lb.	.18	.20	.18	.20	.18	.21
Muriate, bgs, dom, blk unit	.56	.58	.56	.58	.53½	.58
Oxalate, bbls . . . . lb.	.28	.30	.28	.30	.25	.30
Perchlorate, kgs, wks (*FP*) . . . . lb.	.09½	.11	.09½	.11	.09½	.11

* Spot price is ⅛c higher.
(*FP*) Full Priority. (*PC*) Price Control.

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Potassium (continued):						
Permanganate, USP, crys, 500 & 1000 lb drs, wks (*FP*) ....lb.	.19¾	.21	.19¾	.21	.19¼	.21
Prussiate, red, bbls ....lb.	no prices		no prices		no prices	
Yellow, bbls ....lb.	.17	.19	.17	.19	.16	.19
Sulfate, 90% basis, bgs ton	...	36.25	...	36.25	...	36.25
Titanium Oxalate, 200 lb bbls ....lb.	...	.45	...	.45	...	.40
Pot & Mag Sulfate, 48% basis bgs ....ton	...	26.00	...	26.00	26.00	27.00
Propane, group 3, tks ....lb.	.03	...	.03	...	.03¾	.04
Putty, com'l, tubs ....100 lb.	...	3.15	...	3.15	...	3.15
Linseed Oil, kgs ...100 lb.	...	5.00	...	5.00	...	5.00
Pyrethrum, conc liq:						
2.4% pyrethrins, drs, frt all'd ....gal.	...	4.30	...	4.30	4.40	4.95
3.6% pyrethrins, drs, frt all'd ....gal.	...	6.35	...	6.35	6.60	7.20
Flowers, coarse, bgs ...lb. bgs ....lb.	.21	.22	.21	.22	.20	.25
Fine powd, bbls .....lb.	.22	.23	.22	.23	.21	.26
Pyridine, denat, 50 gal drs gal.	...	1.71	...	1.71	...	1.71
Refined, drs ....lb.	...	.46	...	.46	...	.48
Pyrites, Spanish cif Atlantic ports, blk ....unit	no prices		no prices		no prices	
Pyrocatechin, CP, drs, tins lb.	2.15	2.40	2.15	2.40	2.15	2.40
Q						
Quebracho, 35% liq tks ..lb.	...	.05¼	...	.05¼	.03¾	.05½
450 lb bbls, c-l ......lb.	...	.05	...	.05	.04¼	.05
Solid, 63%, 100 lb bales cif ....lb.	...	.04⅞	...	.04⅞	...	.04⅞
Clarified, 64% bales ..lb.	...	.05	...	.05	.05	.05⅛
Quercitron, 41 deg liq, 450 lb. bbls ....lb.	...	.10	...	.10	.08½	.09½
Solid, drs ....lb.	...	.18	...	.18	.11	.16½
R						
R Salt, 250 lb bbls, wks ..lb.	...	.55	...	.55	...	.55
Resorcinol, tech cans .....lb.	.68	.74	.68	.74	.68	.74
Rochelle Salt, cryst ......lb.	...	.43½	...	.43½	.32½	.43½
Powd, bbls ....lb.	...	.42½	...	.42½	.31½	.42½
Rosin Oil, bbls, first run gal.	...	.48	...	.48	.40	.50
Second run ....gal.	...	.50	...	.50	.42	.56
Third run, drs ....gal.	...	.54	...	.54	.46	.57
Rosins 600 lb bbls, 100 lb unit ex, yard NY:**						
B	...	3.66	3.65	3.66	2.06	3.55
D	...	3.45	3.45	3.65	2.08	3.55
E	...	3.74	3.72	3.74	2.07	3.62
F	...	3.74	3.74	3.79	2.08	3.59
G	...	3.74	3.74	3.79	2.18	3.52
H	...	3.74	3.74	3.79	2.27	3.50
I	...	3.74	3.74	3.79	2.26	3.50
K	...	3.75	3.75	3.88	2.36	3.61
M	...	3.79	3.79	3.94	2.38	3.68
N	...	4.05	4.02	4.05	2.47	3.71
WG	...	4.81	4.75	4.81	2.79	4.52
WW	...	5.20	4.85	5.20	3.05	4.57
X	...	5.20	4.85	5.20	3.10	4.57
Rosins, Gum, Savannah (280 lb. unit):**						
B	...	2.90	2.90	3.10	1.31	3.00
D	...	3.11	3.11	3.21	1.51	3.00
E	...	3.19	3.19	3.27	1.60	3.07
F	...	3.19	3.19	3.24	1.62	3.04
G	...	3.19	3.19	3.24	1.60	2.97
H	...	3.19	3.19	3.24	1.63	2.97
I	...	3.19	3.19	3.24	...	2.98
K	...	3.20	3.20	3.30	1.84	3.06
M	...	3.24	3.24	3.39	2.01	3.13
N	...	3.50	3.47	3.50	2.65	3.16
WG	...	4.26	4.18	4.26	2.76	3.97
WW	...	4.65	4.30	4.65	2.96	4.02
X	...	4.65	4.30	4.65	2.96	4.02
Rosin, Wood, c-l, FF grade, NY	1.70	2.00	1.70	2.00	1.40	2.00
Rotten Stone, bgs mines ton	25.50	37.50	25.50	37.50	25.50	37.50
Imported, lump, bbls ..lb.	no prices		no prices		no prices	
Powdered, bbls ......lb.	no prices		no prices		no prices	
S						
Sago Flour, 150 lb bgs ..lb.	.05	.05¾	.04¾	.05¾	.03½	.05½
Sal Soda, bbls wks ...100 lb.	...	1.20	...	1.20	...	1.20
Salt Cake, 94-96%, c-l, bulk wks ....ton	...	15.00	...	15.00	13.00	17.00
Chrome, c-l, wks ......ton	...	16.00	...	16.00	...	16.00
Saltpetre, gran, 450-500 lb bbls ....lb.	...	.082	...	.082	.076	.082
Cryst, bbls ....lb.	...	.092	...	.092	.086	.092
Powd, bbls ....lb.	...	.092	...	.092	.086	.092
Satin, White, pulp, 550 lb bbls ....lb.	.01¼	.01½	.01¼	.01½	.01¼	.01½
Schaeffer's Salt, kgs .....lb.	...	.46	...	.46	...	.46

** Jan. 30. 1941, high and low based on 280 lb. unit.

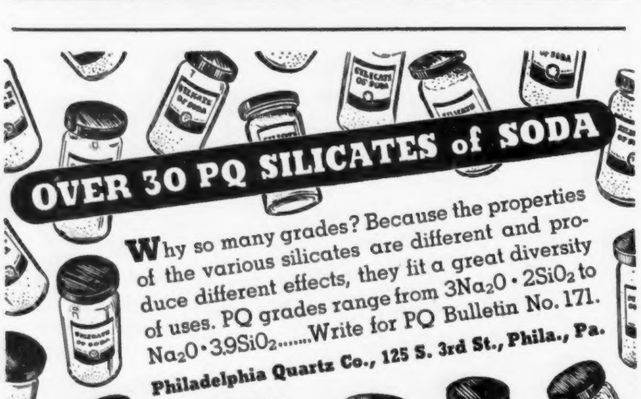
r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 2c; Philadelphia deliveries f.o.b. N. Y.. refined 6c higher in each case; (*FP*) Full Priority.

Current

Shellac
Tungstate

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Shellac, Bone dry, bbls . . lb. *s*	.39	.40	.39	.40	.26	.40
Garnet, bgs . . . . lb.	.37	.39	.37	.39	.20	.39
Superfine, bgs . . . . lb. *s*	.33	.34	.33	.34	.16½	.34
T. N., bgs . . . . lb. *s*	.32	.33	.32	.33	.16	.33
Silver Nitrate, vials . . . . . . oz.	. . .	.26⅞	. . .	.26⅞	.24	.26⅞
Slate Flour, bgs, wks . . . . ton	9.00	10.00	9.00	10.00	9.00	10.00
Soda Ash, 58% dense, bgs, c-l, wks . . . . 100 lb.	. . .	1.15	. . .	1.15	. . .	1.15
58% light, bgs . . . . 100 lb.	1.05	1.08	1.05	1.08	1.05	1.08
blk . . . . 100 lb.	. . .	.90	. . .	.90	. . .	.90
paper bgs . . . . 100 lb.	1.05	1.08	1.05	1.08	1.05	1.08
bbls . . . . 100 lb.	. . .	1.35	. . .	1.35	1.35	1.45
Caustic, 76% grnd & flake, drs . . . . 100 lb.	. . .	2.70	. . .	2.70	. . .	2.70
76% solid, drs . . . . . 100 lb.	. . .	2.30	. . .	2.30	. . .	2.30
Liquid sellers, tks . . 100 lb.	. . .	2.00	. . .	2.00	. . .	2.00
SODIUM						
Sodium Abietate, drs . . . . . lb.	. . .	.11	. . .	.11	. . .	.11
Acetate, 60% tech, gran. powd, flake, 450 lb bbls wks . . . . lb.	. . .	.05	. . .	.05	.04	.06
90%, bbls 275 lb delv lb.	.06½	.07	.06½	.07	.06	.07
anhyd, drs, delv . . . . . lb.	.08½	.10	.08½	.10	.08¼	.10
Alginate, drs . . . . lb.	.69	.73	.69	.73	.39	.73
Antimoniate, bbls . . . . . . lb.	.15	.15½	.15	.15½	.14	.15½
Arsenate, drs . . . . lb.	. . .	.08	. . .	.08	.07	.08¾
Arsenite, liq, drs . . . . . . gal.	. . .	.35	. . .	.35	. . .	.35
Dry, gray, drs, wks . . lb.	. . .	.06¾	. . .	.06¾	.06½	.09¼
Benzoate, USP kgs . . . . lb.	.46	.50	.46	.50	.46	.50
Bicarb, powd, 400 lb bbl, wks . . . . 100 lb.	. . .	1.70	. . .	1.70	. . .	1.70
Bichromate, 500 lb cks, wks* (*FP*) . . . . lb.	. . .	.07⅜	. . .	.07⅜	.06⅞	.07½
Bisulfite, 500 lb bbls, wks lb.	.03	.031	.03	.031	.03	.031
35-40% sol bbls, wks 100 lb.	1.40	1.80	1.40	1.80	1.40	1.80
Chlorate, bgs, wks . . . . . lb.	. . .	.06¼	. . .	.06¼	. . .	.06¼
Cyanide, 96-98%, 100 & 250 lb drs, wks . . . . . . lb.	.14	.15	.14	.15	.14	.15
Diacetate, 33-35% acid, bbls, lcl, delv . . . . lb.	.09½	.10½	.09½	.10½	.09	.10
Fluoride, white 90%, 300 lb bbls, wks . . . . lb.	. . .	.08	. . .	.08	.07	.08
Hydrosulfite, 200 lb bbls, f.o.b. wks . . . . lb.	.17	.18	.17	.18	.17	.18
Hyposulfite, tech, pea crys 375 lb bbls, wks . . 100 lb.	. . .	2.75	. . .	2.75	. . .	2.80
Tech, reg cryst, 375 lb bbls, wks . . . . 100 lb.	. . .	2.45	. . .	2.45	. . .	2.45
Iodide, Jars . . . . lb.	. . .	2.42	. . .	2.42	. . .	2.42
Metanilate, 150 lb bbls . . lb.	. . .	.40	. . .	.40	.41	nom.
Metasilicate, gran, c-l, wks . . . . 100 lb.	. . .	2.50	. . .	2.50	2.35	2.50
cryst, drs, c-l, wks 100 lb.	. . .	3.05	. . .	3.05	. . .	3.05
Anhydrous, wks, c-l, drs . . . . 100 lb.	. . .	4.00	. . .	4.00	3.75	4.00
wks, lcl, drs . . . 100 lb.	. . .	5.05	. . .	5.05	5.05	5.05
Monohydrated, bbls . . . . lb.	. . .	.026	. . .	.026	.023	.026
Naphthenate, drs . . . . . . lb.	.12	.19	.12	.19	.12	.19
Naphthionate, 300 lb bbl lb.	. . .	.50	. . .	.50	. . .	.50
Nitrate, 92% crude, 200 lb. bgs, c-l, NY . . . . ton	. . .	29.35	. . .	29.35	28.70	29.35
100 bgs, same basis . . ton	. . .	30.05	. . .	30.05	29.40	30.05
Bulk . . . . ton	. . .	27.00	. . .	27.00	. . .	27.00
Nitrite, 500 lb bbls . . . . lb.	. . .	.06¾	. . .	.06¾	.06¾	.11½
Orthochlorotoluene, sulfonate, 175 lb bbls, wks lb.	.25	.27	.25	.27	.25	.27
Orthosilicate, 300 lb drs, c-l anhyd. . . . . lb.	. . .	.04¾	. . .	.04¾	.04½	.04¾
Perborate, drs, 400 lb . . lb.	. . .	.14¾	. . .	.14¾	.14¾	.15¼
Peroxide, bbls, 400 lb . . lb.	. . .	.17	. . .	.17	. . .	.17
Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb.	2.75	2.90	2.75	2.90	2.30	2.90
bgs, wks . . . . . . 100 lb.	2.55	2.70	2.55	2.70	2.10	2.70
Tri-sodium, tech, 325 lb. bbls, wks . . . . . . 100 lb.	2.90	3.05	2.90	3.05	2.45	3.05
bgs, wks . . . . . . 100 lb.	2.70	2.85	2.70	2.85	2.25	2.85
Picramate, 160 lb kgs . . lb.	. . .	.65	. . .	.65	. . .	.65
Prussiate, Yellow, 350 lb bbls, wks . . . . lb.	. . .	.11	. . .	.11	.10½	.11
Pyrophosphate, anhyd, 100 lb bbls f.o.b. wks frt eq lb.	.0545	.0638	.0545	.0638	.0510	.0610
Sesquisilicate, drs, c-l, wks . . . . 100 lb.	. . .	3.05	. . .	3.05	. . .	3.05
Silicate, 60°, 55 gal drs, wks . . . . 100 lb.	. . .	1.70	. . .	1.70	. . .	1.70
40°, 55 gal drs, wks 100 lb.	. . .	.80	. . .	.80	. . .	.80
tks, wks . . . . . . 100 lb.	. . .	.65	. . .	.65	. . .	.65
Silicofluoride, 450 lb bbls NY . . . . lb.	.12	.15	.12	.15	.09¾	.15
Stannate, 100 lb drs . . . . lb.	.33½	.36½	.33½	.36½	.32½	.37
Stearate, bbls . . . . lb.	.19	.24	.19	.24	.19	.24
Sulfanilate, 400 lb bbls lb.	.16	.18	.16	.18	.16	.18
Sulfate, Anhyd, 550 lb bgs c-l, wks . . . . 100 lb. *t*	1.70	1.90	1.70	1.90	1.45	1.90
Sulfide, 80% cryst, 440 lb. bbls, c-l, wks . . . . . . lb.	. . .	.024	. . .	.024	.02¼	.03
Solid, 650 lb drs, c-l, wks . . . . lb.	. . .	.0315	. . .	.0315	.03	.03¾
Sulfite, powd, 400 lb bbls wks . . . . lb.	. . .	.05¼	. . .	.05¼	. . .	.05¼
Sulfocyanide, drs . . . . . . lb.	.55	.65	.55	.65	.28	.65
Sulforicinoleate, bbls . . . lb.	. . .	.12	. . .	.12	. . .	.12
Supersilicate (see sodium sesquisilicate)						
Tungstate, tech, crys, kgs lb.	no prices		no prices		no prices	

s T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y. *t* Bags 15c lower; * Feb. 28. (*PC*) Price Control.



Prices

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Sorbitol, drs, wks ....lb.	...	.17¾	...	.17¾	.14¾	.17¾
Spruce, Extract, ord, tks ..lb.	...	.01¼	...	.01¼	.01⅛	.01¼
Ordinary, bbls ....lb.	...	.01¾	...	.01¾	.01⅝	.01¾
Super spruce ext, tks ..lb.	...	.01½	...	.01½	.01⅜	.01½
Super spruce ext, bbls ..lb.	...	.02	...	.02	.01⅞	.02
Super spruce ext, powd, bgs ....lb.	...	.04	...	.04	...	.04
Starch, Pearl, 140 lb bgs 100 lb.	...	3.10	...	3.10	2.90	3.10
Powd, 140 lb bgs ..100 lb.	...	3.20	...	3.20	3.05	3.80
Potato, 200 lb bgs .....lb.	...	.0610	...	.0610	.04½	.0585
Imp, bgs ....lb.	no prices		no prices		no prices	
Rice, 200 lb bbls ......lb.	.09	.10	.09	.10	.07½	.09½
Sweet Potato, 240 lb bbls, f.o.b. plant ......100 lb.	nom.	7.00	nom.	7.00	nom.	7.00
Wheat, thick, bgs .....lb.	...	.05	...	.05	...	.05
Strontium, carbonate, 600 lb bbls, wks ....lb.	no prices		no prices		no prices	
Nitrate, 600 lb bbls, NY lb.	.07¾	.08¾	.07¾	.08¾	.07¾	.08¾
Sucrose, octa-acetate, den, grd, bbls, wks ....lb.	...	.45	...	.45	...	.45
tech, bbls, wks ....lb.	...	.40	...	.40	...	.40

SULFUR

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Sulfur, crude, f.o.b. mines ton	...	16.00	...	16.00	...	16.00
Flour, com'l, bgs ...100 lb.	1.65	1.95	1.65	1.95	1.40	1.95
bbls ....100 lb.	1.95	2.50	1.95	2.50	1.95	2.50
Rubbermakers, bgs .100 lb.	...	2.05	...	2.05	...	2.05
bbls ....100 lb.	...	2.35	...	2.35	...	2.35
Extra fine, bgs ....100 lb.	...	2.35	...	2.35	...	2.35
Superfine, bgs .....100 lb.	2.65	2.80	2.65	2.80	2.65	2.80
bbls ....100 lb.	2.25	3.10	2.25	3.10	2.25	3.10
Flowers, bgs ....100 lb.	3.05	3.35	3.05	3.35	2.80	3.35
bbls ....100 lb.	3.40	3.70	3.40	3.70	3.15	3.70
Roll, bgs ....100 lb.	2.40	2.70	2.40	2.70	2.15	2.70
bbls ....100 lb.	2.30	2.85	2.30	2.85	2.30	2.85
Sulfur Chloride, 700 lb drs, wks ....lb.	.03	.08	.03	.08	.03	.08
Sulfur Dioxide, 150 lb cyl lb.	.07	.09	.07	.09	.07	.09
Multiple units, wks ....lb.	.04½	.07	.04½	.07	.04½	.07
tks, wks ....lb.	.04	.06	.04	.06	.04	.06
Refrigeration, cyl, wks .lb.	.16	.40	.16	.40	.16	.40
Multiple units, wks ....lb.	.07½	.10	.07½	.10	.07½	.10
Sulfuryl Chloride ....lb.	.15	.40	.15	.40	.15	.40
Sumac, Italian, grd .....ton	no prices		no prices		no prices	
Extract, 42°, bbls ......lb.	.08	.06¼	.08	.06¼	.06	.08
Superphosphate, 16% bulk, wks ....ton	...	10.10	...	10.10	8.50	10.00
Run of pile ....ton	...	9.60	...	9.60	8.00	9.60
Triple, 40-48%, a.p.a. bulk, wks, Balt. unit .....ton	...	.80	...	.80	.68	.80

T

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Talc, Crude, 100 lb bgs, NY ton	14.00	16.00	14.00	16.00	14.00	16.00
Ref'd 100 lb bgs, NY ton	17.25	19.25	17.25	19.25	17.25	19.25
French, 220 lb bgs, NY ton	no prices		no prices		no prices	
Ref'd, white bgs, NY ton	no prices		no prices		no prices	
Italian, 220 lb bgs to arr ton	no prices		no prices		no prices	
Ref'd, white bgs, NY ton	no prices		no prices		no prices	
Tankage, Grd, NY ....unit u	...	4.60	4.25	4.60	2.35	4.10
Ungrd ....unit u	...	5.60	5.25	5.60	2.35	5.10
Fert grade, f.o.b. Chgo unit u	...	5.85	5.60	5.85	2.35	5.60
South American cif unit u	...	5.45	5.05	5.45	2.60	4.75
Tapioca Flour, high grade, bgs ....lb.	.04½	.07	.04½	.07	.03	.06¾
Tar Acid Oil, 15%, drs .gal.	...	.27½	...	.27½	.22	.24
25% drs ....gal.	...	.31½	...	.31½	.25	.27½
Tar, pine, delv, drs ....gal.	...	.32½	...	.32½	.26	.29
tks, delv, E. cities ....gal.	...	.24	...	.24	...	.22
Tartar Emetic, tech, bbls lb.	...	.47¾	...	.47¾	.36¾	.47¾
USP, bbls ....lb.	.52¾	.53	.52¾	.53	.42	.53
Terpineol, den grade, drs lb.	...	.17	...	.17	...	.17
Tetrachlorethane, 650 lb drs lb.	.08	.08½	.08	.08½	.08	.08½
Tetrachlorethylene, drs, tech lb.	.08	.09	.08	.09	.08	.09
Tetralene, 50 gal drs, wks lb.	...	.19	...	.19	.19	.21
Thiocarbanilid, 170 lb bbls lb.	...	.24	...	.24	...	.24
Tin, crystals 500 lb bbls, wks lb	.39	.39½	.39	.39½	.38	.40
Metal, NY (*PC*) .... lb.	...	.52	...	.52	.501	.52¾
Oxide, bbls, wks ..... lb.	.55	.57	.55	.57	.54	.56
Tetrachloride, 100 lb drs, wks .... lb.	no prices		no prices		.25¼	.31
Titanium Dioxide, 300 lb bbls lb.	...	.14½	...	.14½	.13¾	.14½
Barium Pigment, bbls lb.	.05¾	.06½	.05¾	.06½	.05¾	.06½
Calcium Pigment, bbls lb.	.05½	.05¾	.05½	.05¾	.05½	.05¾
Titanium tetrachloride, drs, f.o.b. Niagara Falls ... lb.	.32	.45	.32	.45	.32	.45
Titanium trichloride 23% sol, bbls f.o.b. Niagara Falls lb.	.22	.26	.22	.26	.22	.26
20% solution, bbls .....lb.	.175	.215	.175	.215	.175	.215
Toluidine, mixed, 900 lb drs, wks ....lb.	...	.26	...	.26	...	.26
Toluol, drs, wks (*FP*) ..gal.	...	.33	...	.33	.32	.33
tks, frt all'd (*FP*) ....gal.	...	.28	...	.28	.27	.28
Toner Lithol, red, bbls ...lb.	.55	.60	.55	.60	.55	.60
Para, red, bbls ....lb.	.70	.75	.70	.75	.70	.75
Toluidine, bgs ....lb.	...	1.05	...	1.05	...	1.05
Triacetin, 50 gal drs, wks, lb.	...	.26	...	.26	...	.26
Triamyl Borate, lcl, drs, wks, lb.	...	.33	...	.33	.27	.33
Triamylamine, drs, lcl, wks, drs .... lb.	...	1.01	...	1.01	...	1.01
Tributylamine, lcl, drs, f.o.b. wks .... lb.	...	.81	...	.81	...	.81
Tributyl citrate, drs, frt all'd lb.	...	.24		.24	.24	26

(*FP*) Full Priority.

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Tributyl Phosphate, frt all'd lb.	...	.47	...	.47	.42	.47
Trichlorethylene, 600 lb drs, frt all'd E. Rocky Mts lb.	...	.08	...	.08	.08	.09
Tricresyl phosphate, tech, (*FP*) ....lb.	...	.25	...	.25	.22	.36½
Triethanolamine, 50 gal drs,						
wks ....lb.	...	.19	...	.19	...	.19
tks, wks ....lb.	...	.18	...	.18	...	.18
Triethylamine, lcl, drs, f.o.b. wks ....lb.	...	1.16	...	1.16	...	1.16
Triethylene glycol, drs, wks lb.	...	.26	...	.26	...	.26
Trihydroxyethylamine Oleate, bbls ....lb.	...	.30	...	.30	...	.30
Stearate bbls ....lb.	...	.30	...	.30	...	.30
Trimethyl Phosphate, drs, lcl, f.o.b. dest. ....lb.	...	.54	...	.54	.50	.54
Trimethylamine, c-l, drs, frt all'd E. Mississippi ....lb.	...	.85	...	.85	.85	1.00
Triphenylguanidine ....lb.	.58	.60	.58	.60	.58	.60
Triphenyl Phosphate, drs (*FP*) ....lb.	...	.88	...	.88	.38	.88
Tripoli, airfloated, bgs, wks ton	21.00	26.00	21.00	26.00	21.00	26.00
Turpentine (Spirits), c-l, NY dock, bbls ....gal.	...	.80	.80	.82½	.45	.83
Savannah, bbls ....gal.	...	.70½	...	.70½	.33½	.72½
Wood Steam dist, drs, c-lcl, NY ....gal.	.77	.80	.77	.80	.35	.76
tks, delv E. cities ..gal.	...	.72	...	.72	...	...
Wood, dest dist, cl-lcl, drs, delv E. cities ....gal.	.65	.70	.65	.70	.35	.65
tks, delv E. cities ..gal.	...	.58	...	.58	...	...
U						
Urea, pure 112 lb cases ..lb.	...	.12	...	.12	...	.12
Fert grade, bgs, c. i. f. S.A. points ....ton	no prices		no prices		no prices	
Dom f.o.b., wks ....ton	...	80.00	...	80.00	...	85.00
Urea Ammonia, liq., nitrogen basis ....ton	..	121.58	...	121.58	..	121.58
V						
Valonia beard, 42%, tannin bgs ....ton	no prices		no prices		no prices	
Cups, 32% tannin bgs ..ton	no prices		no prices		no prices	
Extract, powd, 63% ...lb.	no prices		no prices		no prices	
Vanillin, ex eugenol, 25 lb tins, 2000 lb lots ....lb.	...	2.60	...	2.60	...	2.60
Ex-guaiacol ....lb.	...	2.35	...	2.35	2.50	2.55
Ex-lignin ....lb.	...	2.35	...	2.35	2.50	2.55
Vermilion, English, kgs ..lb.	3.12	3.17	3.12	3.17	3.12	3.17
W						
Wattle Bark, bgs ....ton	41.00	43.00	41.00	43.00	37.50	43.00
Extract, 60°, tks, bbls ..lb.	.046	.0475	.046	.0475	.03⅞	.05
Wax, Bayberry, bgs ......lb.	.18	.20	.18	.20	.18	.20
Bees, bleached, white 500 lb slabs, cases ....lb.	...	.61	.58	.61	.36½	.56
Yellow, African, bgs ..lb.	...	.49	...	.49	.30	.47
Brazilian, bgs .....lb.	...	.50	...	.50	.31	.50
Refined, 500 lb slabs, cases lb.	.55	.56	.55	.56	.35	.52
Candelilla, bgs ....lb.	...	.58	.33	.38	.19	.33
Carnauba, No. 1, yellow, bgs ....lb.	.87	.88	.87	.88	.68	.88
No. 2, yellow, bgs ...lb.	.86	.87	.86	.87	.66	.85
No. 2, N. C., bgs ....lb.	.82	.83	.82	.84	.62	.79
No. 3, Chalky, bgs ...lb.	.75	.76	.75	.77	.55	.78
No. 3, N. C., bgs ....lb.	.77	.78	.77	.79	.58	.79
Ceresin, dom, bgs .....lb.	.13½	.14	.13½	.14	.11	.14
Japan, 224 lb cases ....lb.	.35	.40	.30	.40	.16½	.35
Montan, crude, bgs ....lb.	.45	.46	.45	.46	.45	.46
Paraffin, see Paraffin Wax.						
Spermaceti, blocks, cases lb.	.26	.27	.24	.27	.24	.25
Cakes, cases ....lb.	.27	.28	.25	.28	.25	.26
Wood Flour, c-l, bgs ....ton						
bgs, c-l, wks ....ton	24.00	25.00	24.00	25.00	24.00	25.00
Whiting, chalk, com 200 lb	18.00	19.00	18.00	19.00	18.00	19.00
Gilders, bgs, c-l, wks ..ton	16.00	20.00	16.00	20.00	16.00	20.00
X						
Xylol, frt all'd, East 10° tks, wks ....gal.	...	.27	...	.27	...	.29
Com'l tks, wks, frt all'd gal.	...	.27	...	.27	.26	.27
Xylidine, mixed crude, drs lb.	.35	.36	.35	.36	.35	.36
Z						
Zein, bgs, 1000 lb lots, wks ....lb.	...	.20	...	.20	...	.20
Zinc Acetate, tech, bbls, lcl, delv ....lb.	.16	.17	.16	.17	.15	.16
Arsenite, bgs, frt all'd ..lb.	...	.12	...	.12	...	.12
Carbonate tech, bbls, NY lb.	.14	.20	.14	.20	.14	.20
Chloride fused, 600 lb drs, wks ....lb.	...	.05	...	.05	...	.05
Gran, 500 lb drs, wks lb.	...	.0575	...	.0575	...	.0575
Soln 50%, tks, wks 100 lb.	...	2.50	...	2.50	2.25	2.50

(*FP*) Full Priority. (*PC*) Price Control.

Prices Current

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Zinc (continued)						
Cyanide, 100 lb drs .... lb.	.33	.37	.33	.37	.33	.37
Dust, 500 lb bbls, c-l, delv lb.	...	.1035	...	.1035	.09¼	.1035
Metal, high grade slabs, c-l, NY (*FP*) (*PC*) 1000 lb.	...	8.65	...	8.65	7.65	8.64
E. St. Louis ..... 100 lb.	...	8.25	...	8.25	7.25	8.25
Oxide, Amer, bgs, wks lb.	...	.07¼	...	.07¼	.06½	.07¼
French 300 lb bbls, wks lb.	...	.07¼	...	.07¼	.06¾	.07¼
Palmitate, bbls .... lb.	.32	.33	.32	.33	.24½	.33
Resinate, fused, pale bbls lb.	...	.10	...	.10	...	.10
Stearate, 50 lb bbls .... lb.	.30	.31	.30	.31	.22	.31
Sulfate, crys, 40 lb bbls wks .... lb.	...	.365	...	.365	.315	.365
Flake, bbls .... lb.	...	.405	...	.405	.335	.405
Sulfide, 500 lb bbls, delv lb.	...	.08	...	.08	...	.08
bgs, delv .... lb.	.14	.14¼	.14	.14¼	.08	.13¼
Sulfocarbolate, 100 lb kgs lb.	.24	.29	.24	.29	.03⅜	.07¾
Zirconium Oxide, crude, 70-75% grd, bbls, wks ton	75.00	100.00	75.00	100.00	75.00	100.00

Oils and Fats

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Babassu, tks, futures ..... lb.	no prices		no prices		...	.06
Castor, No. 3, 400 lb drs lb.	...	.12½	...	.12½	.0180	.12½
(*PC*) Blown, 400 lb drs lb.	...	.14	...	.14	.11¾	.14
China Wood, drs, spot NY lb.	.40⅛	nom.	.40⅛	nom.	.27¼	.37¼
Tks, spot NY .... lb.	.38¾	nom.	.38¾	nom.	.26¼	.35½
Coconut, edible, drs NY .. lb.	no prices		no prices		.08	.15½
Manila, tks, NY .... lb.	no prices		no prices		.03⅜	.10
Tks, Pacific Coast .... lb.	...	no prices	...		no prices	.03¼
Cod, Newfoundland, 50 gal bbls .... gal.	...	.85	...	.85	.07½	.80
Copra, bgs, NY .... lb.	no prices		no prices		.0180	.04¼
Corn, crude, tks, mills ... lb.	.12¾	nom.	.12½	.12¾	.06⅝	.13
Refd, 375 lb bbls, NY .. lb.	.15½	nom.	...	.15½	.14¾	.16
Degras, American, 50 gal bbls, NY .... lb.	.11½	.12⅛	.11½	.12⅛	.07½	.08¾
Greases, Yellow .... lb.	...	.0929	...	.0929	.04¾	.08½
White, choice, bbls, NY lb.	...	.097	...	.097	.05	.09
Lard, Oil, Edible, prime .. lb.	...	.15½	...	.15½	.08½	.14½
Extra, bbls .... lb.	...	.15	...	.15	.08¼	.13¾
Extra, No. 1, bbls ..... lb.	...	.14½	...	.14½	.08	.13¼
Linseed, Raw less than 5 drs lots .... lb.	.125	.127	.125	.127	.091	.123
drs, c-l, spot .... lb.	.117	.119	.117	.119	.095	.190
Tks .... lb.	.108	.112	.108	.112	.084	.1060
Menhaden, tks, Baltimore gal.	...	.666	.63¾	.666	.30	.60
Refined, alkali, drs .... lb.	.12	.124	.12	.124	.084	.122
Kettle boiled, drs ..... lb.	.13	.134	.13	.134	.096	.132
Light pressed, drs ..... lb.	.11	.114	.11	.114	.082	.112
Tks .... lb.	.102	nom.	.102	nom.	.072	.10
Neatsfoot, CT, 20°, bbls, NY lb.	...	.25¾	...	.25¾	.18¼	.26½
Extra, bbls, NY ...... lb.	...	.14½	...	.14½	.08¼	.14
Pure, bbls, NY .... lb.	...	.17¾	...	.17¾	.12¼	.17¾
Oiticica, bbls .... lb.	.25¼	nom.	.25¼	nom.	16½	.23½
Oleo, No. 1, bbls, NY ... lb.	...	.13¼	...	.13¼	.07⅜	.13¼
No. 2, bbls, NY ...... lb.	...	.13	...	.13	.07⅜	.13
Olive, denat, bbls, NY .. gal.	4.40	4.50	4.00	4.50	2.25	4.25
Edible, bbls, NY ...... gal.	5.00	5.30	5.00	5.30	4.75	5.30
Foots, bbls, NY .... lb.	.19½	.20	.19	.20	.10¼	.19
Palm, Kernel, bulk ...... lb.	no prices		no prices		no prices	
Niger, cks .... lb.	.09¼	nom.	.09¼	nom.	.04¼	.09
Sumatra, tks .... lb.	no prices		no prices		.02	.09
Peanut, tks, f.o.b. mill ... lb.	.13	...	.13	...	.05¼	.16
Refined, bbls, NY ..... lb.	.16¾	nom.	.16¾	nom.	.08	.16
Perilla, drs, NY .... lb.	...	.246	...	.246	.18	.23
Tks, Coast .... lb.	...	.2380	...	.2380	.16½	.21½
Pine, see Pine Oil, Chem. Sec.						
Rapeseed, blown, bbls, NY lb.	.18	.18½	.18	.18½	.16½	.18
Denatured, drs, NY .. gal.	...	nom.	...	nom.	.95	1.00
Red, Distilled, drs .... lb.	.12¾	.14	.12¾	.14	.07¼	.13
Tks .... lb.	.12	.12½	.12	.12½	.06¼	.11½
Sardine, Pac Coast, tks .. gal.	.66½	nom.	.66½	nom.	.39	.62½
Refined alkali, drs ..... lb.	.12	.124	.12	.124	...	...
Light pressed, drs ..... lb.	.11	.114	.11	.114	.084	.122
Tks .... lb.	.102	nom.	.102	nom.	.078	.112
Soy Bean, crude						
Dom, tks, f.o.b. mills .. lb.	.12¼	nom.	.12¼	nom.	.05⅜	.12¾
Crude, drs, NY ...... lb.	.13	nom.	.13	nom.	.06¼	.12¼
Ref'd, drs, NY .... lb.	.14¼	nom.	.14¼	nom.	.05½	.12¼
Tks .... lb.	.13½	nom.	.13½	nom.	.07⅝	.13½
Sperm, 38° CT, bleached (*FP*) bbls, NY ...... lb.	.1301	nom.	.1301	nom.	.11	.127
45° CT, blchd, bbls, NY lb.	.1278	nom.	.1278	nom.	.103	.12
Stearic Acid, double pressed dist bgs .... lb.	.15	.16½	.15	.16½	.09½	.13¾
Double pressed saponified bgs .... lb.	.15¼	.16¾	.15¼	.16¾	.09¾	.14
Triple pressed dist bgs lb.	.18	.19½	.18	.19½	.12½	.16½
Stearine, Oleo, bbls ...... lb.	...	.11	...	.11	...	.09
Tall, crude, drs, c-l, wks ton	...	40.00	...	40.00	...	...
tks, wks .... ton	...	30.00	...	30.00	...	...
dist, drs, c-l, delv .... lb.	...	.04	...	.04	...	...
tks, wks .... lb.	...	.03½	...	.03½	...	...
Tallow City, extra loose .. lb.	...	.097¼	...	.097¼	...	.07⅜
Edible, tierces .... lb.	no prices		no prices		...	.05⅛
Acidless, tks, NY ...... lb.	.13	nom.	.13	nom.	.07½	.11½
Turkey Red, single, drs .. lb.	...	.08¾	...	.08¾	.06½	.08¼
Double bbls .... lb.	...	.12	...	.12	.09½	.11
Whale:						
Winter bleach, bbls, NY lb.	...	.1110	...	.1110	.099	.1110
Refined, nat, bbls NY .. lb.	...	.1070	...	.1070	.095	.1070

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Chemicals

A370. Consulting Chemists and Chemical Engineers. A new eight page booklet under the heading "Foster D. Snell, Inc., Who, What, Why" outlines in brief form the functions of the consulting chemist and chemical engineer. In it are enumerated various methods of co-operation, on different types of problems, with industry, with attorneys and with individuals. Foster D. Snell, Inc.

A371. Metal Finishing; comprehensive 8-page discussion of indium and indium plating. The Indium Corp. of America.

A372. Silicate P's & Q's; Vol. 22, No. 3. Describes the use of Metso 88, an amber colored, liquid silicate containing additional materials to improve wetting and to give good suds, for various industries such as baking, meat packing, dairy, restaurant and others which use soft metal ware. Philadelphia Quartz Co.

A373. Synthetic Organic Chemicals; Vol. 14, No. 1. Contains short article on "Separated Stable Isotopes for the Chemist and Biologist," by David W. Stewart of the Research Laboratories, Eastman Kodak Co.

Equipment—Containers

E622. Air Raid and Blackout Precautions for the Protection of Windows; Bulletins No. 1 and 2. Prepared by Dr. F. W. Adams, Senior Industrial Fellow, Mellon Institute, Dr. S. F. Cox and Mr. R. A. Miller of the Technical and Research Staff of the Pittsburgh Plate Glass Co., and represent a correlation of the currently available information on the subject. They are based upon a study of experience and practice in Great Britain, plus certain experimental data developed in the United States. Pittsburgh Plate Glass Co.

E623. Centrifugal Water Pumps; Bulletin 400. Detailed information and specifications concerning the design and manufacture of these pumps with valuable data on how to pick a pump for a specific job. Chain Belt Co.

E624. Electroplating; A new edition of a booklet which includes specifications for electrodeposited coatings of zinc, cadmium and nickel on steel; nickel and chromium on copper and copper base alloys; nickel and chromium on zinc and zinc base alloys; also methods of testing for local thickness of electrodeposited coatings. These are the tentative specifications of the American Society for Testing Materials, prepared jointly by the American Electroplaters' Society, the National Bureau of Standards and the American Society for Testing Materials. The Hanson-Van Winkle-Munning Co.

E625. Glass-Lined Equipment; Catalog 792. 24-page catalog describes, illustrates and gives engineering information on several series of highly acid-resistant glass-lined steel equipment. The Pfaudler Co.

E626. Heat Exchanger; Bulletin 90. Describes and illustrates, with pictures and drawing, a heat exchanger adaptable to a wide range of installations. Niagara Blower Co.

E627. Metal Hose; Catalog G-41. 38-page catalog flexible metal hose and accessories for use with saturated steam; superheated steam; centralized lubrication systems; milling, grinding and special machinery; hydraulic presses, lifts, etc.; oil burners and oil furnaces; hot tar, hot asphalt, unloading tank cars and tankers; also for various chemicals and other special uses. Chicago Metal Hose Corp.

E628. Mixers; 6-page folder describes, illustrates and gives technical information concerning Rex Slo-Mixers which offer the operators of sewage and water treatment plants the Langlier Process of Multi-Stage flocculation. Chain-Belt Co.

E629. Photoelectric Relays; Descriptive Data 18-310. Photoelectric relays, light sources, and phototube housings for industrial and general use are described in 6-page bulletin. Westinghouse Electric and Manufacturing Co.

E630. Piston-Type Fillers; Bulletin 790. 4-page folder of information on fillers for delivering an accurately measured amount of product to any open top container of glass, tin, or fibre. The Pfaudler Co.

E631. Pressure Recorders; Catalog 22-A. The Foxboro line is well illustrated and described, covering instruments for the measurement and recording of industrial pressures of all kinds, in ranges from 1 inch of water to 20,000 lbs. per sq. in. A complete list of standard ranges is given, accompanied by full-size reproductions of specimen charts. The Foxboro Co.

E632. Priorities and Pyrometers; Defense Bulletin No. 1. This is intended to explain, to users of temperature measuring and control instruments, how the war production program affects these instruments, their purchase, use, maintenance, and the replacements necessary. Wheelco Instruments Co.

E633. Processing Machinery; B6177. 12-page booklet describes, illustrates and gives engineering data on crushing, grinding and milling equipment; and equipment for mechanical separation, washing, disintegrating and material handling. Also roasting furnaces and kilns and pyro-processing equipment. Allis-Chalmers Mfg. Co.

E634. Reaction Kettles; Bulletin 810. New "R" series of high-pressure, glass-lined, steel reaction kettles, ASME code-built, all-welded, one-piece construction is described and illustrated with photos, drawings and specifications. The Pfaudler Co.

E635. Respirators; booklet describes various types of gas masks and hoods for industrial safety. Pulmosan Safety Equipment Corp.

E636. Rotary Fillers; Bulletin 786. 4-page folder describes and illustrates line of fillers used with any product that will flow by gravity such as: fruit juices, syrups, soups, catsup, edible oils, wine, milk products, etc. The Pfaudler Co.

E637. Signalling Controller; Catalog N-95-163(1). Describes new piece of equipment used to test condensate purity continuously. Its self-contained signal lights show whether condensate is above a specified minimum purity and is safe to use again, or whether it is below this limit and should be diverted to waste. In addition, the instrument can operate external warning bells or lights. Or, it can provide automatic two-position control by regulating a motor-driven valve in the condensate line to dump impure condensate. If the operator wishes to measure condensate resistance, he can do so by turning the instrument's control-setting dial until both signal lights are out, and reading the dial scale. Leeds & Northrup Co.

E638. The Laboratory; Vol. 13, No. 1. Interesting booklet contains article, "The Chemist's Part in the National War Effort," There are also a number of items concerning new appliances and equipment of interest to the chemist. Fisher Scientific Co. and Eimer and Amend.

E639. The new 1942 edition of the Johns-Manville Industrial Products Catalog is now available. This 52-page, illustrated book contains a wealth of information and recommendations on high and low temperature insulations for every industrial need from 400 deg. F. below zero to 2500 deg. F. above. Complete data are also included on J-M refractory products and castables; specifications on J-M Bonded Asbestos Built-Up Roofs and J-M Insulated Roofs; detailed information on J-M Corrugated Transite for roofing and siding; on J-M industrial friction materials; on Transite Electrical Conduit and Korduct, Asbestos Ebony and other J-M electrical materials; on Transite Pressure Pipe for industrial and municipal water lines; on Transite industrial vent pipe and stacks; and on J-M packings and gaskets. The catalog also describes in detail J-M Industrial Flooring Plank, Asphalt Tile Flooring and Transite movable partitions.

E640. Transformers; New bulletin describes secondary network transformers for general industrial use, particularly for aviation, ordnance, munitions, and oil refineries. Westinghouse Electric and Manufacturing Co.

E641. Tubing; a convenient Technical Data Card, giving complete table of tolerances for round, seamless-steel, mechanical tubing for both cold-drawn and hot-finished tubes. The Babcock & Wilcox Tube Co.

E642. Wheelco Comments; Vol. 1, No. 3. 2-page folder tells how combustion controls guard against explosion hazards in industrial plants. Wheelco Instruments Co.

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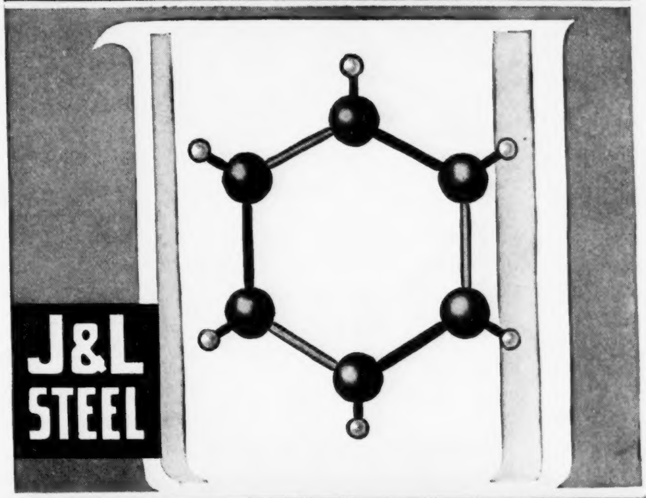


"WE"-EDITORIALLY SPEAKING

We understand that University of California physicists (the news release said physicists not chemists) have reported that they have isolated chemical element No. 61. The only one remaining in the periodic scale is No. 87. And in this connection we recall one of the men in Selective Service telling us recently—"Suggest that the physicists call themselves electricians—the Local Draft Boards will understand better what an electrician does."

And this reminds us of a story that Dr. Joseph Minevich of E. B. Badger & Sons Company told us several years ago at a Chemical Exposition. Said he: "My dear mother could always understand just what my older brother who was a physician did for a living and, of course, for the good of humanity as well. But when I tried to tell her just what a chemical engineer was she simply threw up her hands and said, 'Joe, you have always been a good boy so I just blindly trust you.' "

Latest in waste collection ideas is a trial balloon in the Philadelphia area by RCA-Victor dealers offering 2¢ each for old records. With shellac quite a question mark as a result of the war in the Pacific it is likely that more and more scrap will go into making new records.

Our editorial department this month decided to use a photograph of Donald Nelson, War Production Board Chief, showing him in the act of making a radio plea to the nation for more production. One of the assistant editors got on the phone and called up the photo service which had covered the speech and had taken pictures. "Give us a shot of Donald Nelson," he explained carefully, "as you caught him making that radio speech the other night." Then he went out to lunch.

When he got back from lunch there was a note on his desk—on one of those telephone forms which tell you who called and when. The telephone operator had taken down the message which was from the photo service. "Mr. Nelson called," the note read. "He'll be in after lunch with that photograph you ordered."

According to a study of lightning made at the Westinghouse Laboratories at East Pittsburgh, Pa., there occur annually all over the earth some 1,500,000 electrical storms producing nitric acid which is brought to the earth by the raindrops. These scientists tell us further that more fertilizer is produced this way than by all the fertilizer factories the world over. They undoubtedly are thinking of fertilizer output a few years ago—Mars is the chief customer now.

Apparently Dr. C. D. Looker in his very comprehensive study "Salt as a Chemical Raw Material" published in the November and December, 1941, issues of Chemical Industries overlooked one possible use—putting out incendiary bombs. Prof. William D. Turner of Columbia reports on some interesting tests.

"Three advantages are claimed for salt," Professor Turner states. "It is cheap, it can be purchased in any corner grocery store, and it is packed in sizes which make it easy to handle. Actually it is about as cheap as sand in some regions throughout the metropolitan area. In most localities around New York City sand contractors are charging approximately $1.00 for a 100-pound sack, whereas salt can be purchased at around thirty-five cents for a 25-pound bag."

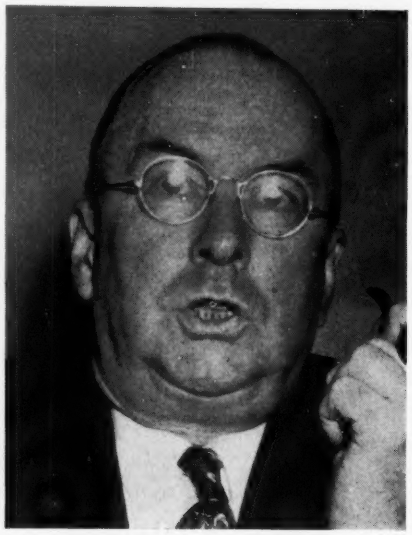
Did you know:—

That many of us have been operating our motor cars on gasoline reduced five to ten per cent in octane rating?

Priorities
Allocations
Price Controls

See the Statistical and Technical Data Section (Part 2 of this issue) for monthly digest of Government Regulations of Materials and Prices. The February issue contained a 16-page section containing all regulations, etc., up to and including Jan. 2, 1942. Limited number of February issues still available at 50c each. Invaluable to you in your work!

The Fighting Chief of the WPB



"Every weapon we make today is worth ten that we might produce next year, for this year—1942—is the critical year in the existence of the United States."—Donald Nelson.

Fifteen Years Ago

From Our Files of March, 1927

Theodore B. Wagner nominated for the presidency of the Chemists' Club.

The beloved Dr. Ira Remson dies at Carmel, Calif., at the age of 81.

House Military Committee rejects bids for Muscle Shoals by American Cyanamid and Farmers Federated Fertilizer Association.

A. Klipstein & Co. absorbs Dunker & Perkins Co. of Boston.

Arthur D. Little elected vice-chairman of the Engineering Foundation of New York.

M. C. Whitaker announces intention of resigning presidency of U. S. Industrial Alcohol Co.

First American manufacture of synthetic methanol gets under way at Belle, near Charleston, W. Va., at plant of Lazote, Inc., affiliated with Du Pont.

John E. Teeple to retire as vice-president of American Potash & Chemical.

VOL. 50 — March '42

CHEMICAL INDUSTRIES

Statistical and Technical Data Section

No. 3 — Part 2

State of Chemical Trade
Current Statistics (Feb. 28, 1942)—p. 100

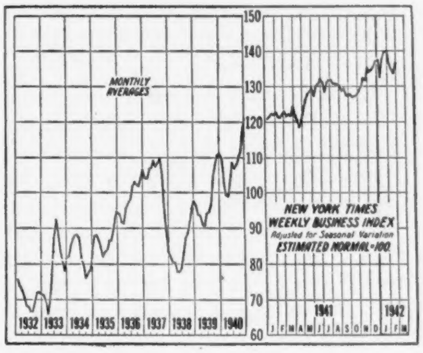
WEEKLY STATISTICS OF BUSINESS

Week Ending	Carloadings 1941	Carloadings 1940	Carloadings % of Change	Electrical Output* 1941	Electrical Output* 1940	Electrical Output* % of Change	Jour. of Com. Price Index	Nat'l Fertilizer Ass'n Price Indices: Chem. & Drugs	Fats & Oils	Fert. Mat.	Mixed Fert.	All Groups	†Labor Dept. Chem. & Drug Price Index	% Steel Activity	N. Y. Times Index Bus. Act.	Fisher Commodity Index
Jan. 31	815,567	714,354	+14.2	3,468,193	2,994,047	+15.8	99.5	120.1	132.7	117.6	114.0	121.8	96.7	94.6	139.9	102.6
Feb. 7	784,060	710,196	+10.4	3,474,638	2,989,392	+16.2	99.9	120.1	135.5	118.0	114.0	122.0	96.6	95.0	136.6	102.4
Feb. 14	782,699	721,176	+ 8.5	3,421,639	2,976,478	+15.0	100.4	120.3	135.6	118.4	114.0	122.5	96.9	95.5	134.9	102.6
Feb. 21	774,595	678,523	+14.2	3,423,589	2,985,585	+14.7	101.1	120.3	135.6	118.3	115.3	123.7	96.9	96.2	133.7	103.1
Feb. 28	781,419	756,670	+ 3.3	3,409,907	2,993,253	+13.9	101.2	120.3	135.8	118.3	115.3	123.8	96.9	96.3	136.7	103.1

MONTHLY STATISTICS

CHEMICAL:	Dec. 1941	Dec. 1940	Nov. 1941	Nov. 1940	Oct. 1941	Oct. 1940
Acid, sulfuric **(expressed as 50° Baumé, short tons, Bureau of the Census)**						
Total prod. by fert. mfrs	No Longer Available		......	......	......	......
Consumpt. in mfr. fert.	......	......	......	......	......	......
Stocks end of month	......	......	......	......	......	......
Alcohol, Industrial **(Bureau Internal Revenue)**						
Ethyl alcohol prod., proof gal..	44,408,521	23,762,244	37,541,115	23,346,835	36,392,523	23,595,180
Comp. denat. prod., wine gal...	2,756,962	948,014	2,603,431	2,269,815	3,600,439	4,811,979
Removed, wine gal.	2,683,441	1,011,972	2,725,465	2,329,505	3,727,292	4,970,413
Stocks end of mo., wine gal...	203,692	453,090	137,197	516,516	260,134	580,542
Spec. denat. prod., wine gal. ...	15,945,814	11,266,809	14,361,093	10,884,671	14,584,252	10,286,463
Removed, wine gal.	15,604,829	11,427,406	14,251,186	11,210,915	14,574,328	10,589,795
Stocks end of mo., wine gal...	924,096	906,414	586,355	1,069,005	479,879	1,399,150
Ammonia sulfate prod., tons *a*..	......	......	61,359	62,934	63,372.9	63,898
Benzol prod., gal. *b*	......	......	12,037,199	11,886,000	12,435,830	12,218,000
Byproduct coke, prod., tons *a*..	......	......	4,833,483	4,763,500	4,970,652	4,853,600
Cellulose Plastic Products **(Bureau of the Census)**						
Nitrocellulose sheets, prod., lbs.	......	......	1,018,435	661,258	1,016,077	748,779
Sheets, ship., lbs.	......	......	1,095,382	730,384	1,052,598	767,010
Rods, prod., lbs.	......	......	337,228	306,670	334,111	248,384
Rods, ship., lbs.	......	......	345,694	305,657	411,953	273,758
Tubes, prod., lbs.	......	......	127,349	92,766	171,123	99,236
Tubes, ship., lbs.	......	......	127,572	94,958	165,588	95,183
Cellulose acetate, sheets, rod, tubes						
Production, lbs.	......	......	557,758	934,006	630,357	983,292
Shipments, lbs.	......	......	609,165	1,036,674	712,099	944,361
Molding comp., ship.; lbs. ...	......	......	2,777,317	1,410,496	3,453,048	1,783,269
Methanol **(Bureau of the Census)**						
Production, crude, gals.	No Longer Available		......	......	......	......
Production, synthetic, gals.	......	......	......	......	......	......
Pyroxylin-Coated Textiles **(Bureau of the Census)**						
Light goods, ship., linear yds...	......	......	4,072,081	3,318,461	4,285,874	3,303,892
Heavy goods, ship., linear yds..	......	......	2,900,534	2,457,154	3,532,725	2,538,265
Pyroxylin spreads, lbs. *c*	......	......	6,522,824	5,775,919	7,488,494	5,851,135
Exports **(Bureau of Foreign & Dom. Commerce)**						
Chemicals and related prod. *d*..	Exports and Imports No Longer Available				......	......
Crude sulfur *d*	......	......	......	......	......	......
Coal-tar chemicals *d*	......	......	......	......	......	......
Industrial chemicals *d*	......	......	......	......	......	......
Imports						
Chemicals and related prod. *d*..	......	......	......	......	......	......
Coal-tar chemicals *d*	......	......	......	......	......	......
Industrial chemicals *d*	......	......	......	......	......	......
Employment **(U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals**						
Chemicals and allied prod., including petroleum	147.9	125.7	147.7	125.3	148.1	125.4
Other than petroleum	152.4	127.1	152.3	126.4	152.7	126.5
Chemicals	186.5	149.9	184.9	148.0	182.5	145.6
Explosives	Not Available		Not Available		Not Available	
Payrolls **(U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals**						
Chemicals and allied prod., including petroleum	198.7	143.9	194.2	139.4	190.7	139.3
Other than petroleum	206.1	145.4	202.3	141.2	197.7	140.2
Chemicals	271.0	187.9	264.6	181.7	249.4	176.2
Explosives	Not Available		Not Available		Not Available	
Price index chemicals*	......	......	88.3	85.1	88.4	85.0
Drugs & Pharmaceuticals* ...	......	......	123.2	95.9	124.1	95.8
Fert. mat.*	......	......	77.3	69.9	77.3	68.1
Paint and paint mat.	......	......	95.3	85.7	96.0	84.8
FERTILIZER:						
Exports **(long tons, Nat. Fert. Association)**						
Fertilizer and fert. materials ...	Exports and Imports No Longer Available				......	......
Total phosphate rock	......	......	......	......	......	......
Total potash fertilizers	......	......	......	......	......	......
Imports **(long tons, Nat. Fert. Association)**						
Fertilizer and fert. materials ...	......	......	......	......	......	......
Sodium nitrate	......	......	......	......	......	......
Total potash fertilizer	......	......	......	......	......	......

Industrial Trends



Business: Overall industrial and business activity continues to grow in spite of the lull occasioned in certain industries by conversion to strictly war-work. The Federal Reserve Board index of industrial production rose further to 170 for January and is estimated at one or two points higher for February. The *New York Times* index of business activity fluctuated considerably during the last month. During the week ended Feb. 28 it rose sharply as a result of more than seasonal gains in several components.

Steel: January production of 7,129,351 tons established record for that month. This total was nearly 3 per cent. more than previous record made in January, 1941. The industry operated at average of 94.7 per cent. of capacity during January, based on revised annual production capacity of 88,570,000 tons as of January 1, 1942. Backlogs are at a peak and consist of large percentage of orders bearing very high priority rating. Deliveries below A priority have practically ceased. Increase in production hinges on scrap, collection of which may be accelerated now with the beginning of good weather.

Carloadings: During first three weeks of February freight loadings averaged about 780,000 cars a week, about 11 per cent. above corresponding period of last year. It is expected that carloadings will hit the 1,000,000 mark some time late in May to top last year's peak of 920,000 cars. If this rate is maintained over summer months and a further seasonal rise occurs in the fall there is little doubt but that priorities will be used to control freight space because manufacturers are not able to get enough steel to build a sufficient number of cars to meet expected requirements.

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Electric Output: Production continues to expand against the usual trend for this time of year. For first three weeks of February output averaged about 3,450,000,000 kilowatthours an increase of about 15.3 per cent. over corresponding period of last year.

Automotive: The industry is making rapid progress on conversion. Orders are being poured into the automotive plants at a tremendous pace, about a billion dollars a week. According to unofficial reports backlogs amount to about thirteen billions of dollars.

Construction: For first time since 1928, building and engineering contracts awarded last year in the 37 eastern states topped the six billion dollar mark. The 1941 total according to the F. W. Dodge Corp., was $6,007,474,000, as compared with $4,003,957,000 in 1940, the previous record year of the post depression period. Most spectacular increase was in manufacturing plant capacity.

Textiles: Production of cotton textiles is being expanded steadily. Military demand is in larger volume than it was a year ago. Estimates indicate that 35 per cent. of total cotton textile production will be purchased by the Government this year as compared with 19 per cent. in 1941. Operations in wool and synthetics industries are also at high levels.

Retail Trade: Retail Trade is up considerably in dollar value, but on unit-sales basis the gains are moderate. Heavy forward buying of last several months is expected to have its consequence in a slow-up during next few months.

Commodities Prices: Advances continued in January and February. Price controls were extended to a number of commodities. Retail prices of food and textile products, not subject to direct control, showed large increases.

Outlook: Although specific information is not in order, hints indicate that war production is hitting its stride, especially in ordnance.

However our reverses in the Far East are causing the War Production Board to raise its sights. The military situation makes acceleration imperative. Effort must be made over and above the expansion program now under way. In order to accomplish objectives, civilian production will be curtailed still more. Conversion to war work will be urged again and again. Small manufacturers will find their best salvation in conversion so as to obtain direct war orders or subcontracts. Labor productivity which has declined because of influx of new and inexperienced workers, will be pushed upward by wage and patriotic incentives. Pressure is increasing for round-the-clock, seven-day week.

MONTHLY STATISTICS (cont'd)

FERTILIZER: (Cont'd)	Dec. 1941	Dec. 1940	Nov. 1941	Nov. 1940	Oct. 1941	Oct. 1940
Superphosphate e (Nat. Fert. Association)						
Production, total	......	......	374,649	345,352	373,413	354,691
Shipments, total	......	......	299,753	176,928	332,336	317,425
Northern area	......	......	135,196	71,201	156,537	179,139
Southern area	......	......	164,557	105,727	175,799	138,286
Stocks, end of month, total	......	......	1,486,673	1,571,998	1,365,692	1,362,129
Tag Sales (short tons, Nat. Fert. Association)						
Total, 17 states	......	......	188,830	106,119	182,588	206,569
Total, 12 southern	......	......	186,453	105,003	168,534	188,799
Total, 5 midwest	......	......	2,377	1,116	14,054	17,770
Fertiliser employment *i*	105.8	95.0	101.2	92.4	103.6	96.7
Fertiliser payrolls *i*	104.4	80.5	99.1	76.5	102.7	82.4
GENERAL:						
Acceptances outst'd'g *f*	......	......	$193	$196	$184	$186
Coal prod., anthracite, tons	4,118,000	4,671,000	3,832,000	3,980,000	5,382,000	4,355,000
Coal prod., bituminous, tons	46,667,000	40,600,000	42,865,000	40,012,000	49,800,000	38,700,000
Com. paper outst'd'g *f*	......	......	$387	$231	$377	$252
Failures, Dun & Bradstreet	......	......	842	1,086	809	1,111
Factory payrolls *i*	......	......	165.5	125.1	166.7	116.2
Factory employment *i*	......	......	134.1	114.2	132.5	111.4
GENERAL MANUFACTURING:						
Automotive production	......	......	352,347	256,101	382,000	493,223
Boot and Shoe prod., pairs	......	......	34,701,613	36,565,529	45,246,238	37,027,350
Bldg. contracts, Dodge *j*	......	......	......	......	606,349	383,069
Newsprint prod., U. S. tons	81,680	80,837	82,621	85,338	87,068	88,192
Newsprint prod., Canada, tons.	300,823	252,897	300,308	282,344	318,787	309,957
Glass containers, gross‡	......	......	6,179	4,352	7,094	4,864
Plate glass prod., sq. ft.	17,491,200	10,310,900	14,276,000	16,059,294	15,768,700	17,070,300
Window glass prod., boxes	......	......	1,299,950	1,264,057	1,524,000	1,348,895
Steel ingot prod., tons	7,163,999	6,493,849	6,969,987	6,469,107	96.4	90.6
% steel capacity	98.1	94.1	98.3	96.6	99.0	96.1
Pig iron prod., tons	5,012,276	4,414,602	4,702,927	4,403,230	4,856,306	4,445,961
U.S. cons'pt. crude rub., lg. tons	......	......	......	......	60,418	59,644
Tire shipments	......	......	4,047,913	4,968,533	5,867,175	5,525,075
Tire production	......	......	3,964,067	4,731,995	4,834,308	5,076,951
Tire inventories	......	......	4,042,995	9,162,995	4,122,836	9,409,683
Cotton consumpt., bales	887,326	777,482	......	......	953,600	770,832
Cotton spindles oper.	......	......	23,069,146	22,685,622	23,043,310	22,456,588
Wool consumption *s*	62.3	46.6	......	45.8	60.6	45.9
Rayon deliv., lbs.	39,300,000	34,000,000	38,500,000	34,800,000	41,700,000	36,700,000
Rayon employment *i*	320.6	315.1	323.2	314.5	325.0	311.1
Rayon payrolls *i*	391.2	334.4	385.8	331.4	386.4	322.6
Soap employment *i*	92.5	84.8	96.4	84.5	97.7	88.8
Soap payrolls *i*	133.6	106.3	138.5	100.2	142.2	107.2
Paper and pulp employment *i*	129.0	115.9	128.6	115.7	128.2	115.1
Paper and pulp payrolls *i*	168.5	128.5	166.7	123.8	165.2	123.8
Leather employment *i*	98.4	85.8	99.7	83.9	96.6	81.6
Leather payrolls *i*	121.5	89.5	117.8	82.8	116.4	81.6
Glass employment *i*	131.9	116.8	133.3	117.0	132.3	113.2
Glass payrolls *i*	172.8	137.6	169.3	130.8	173.7	129.8
Rubber prod. employment *i*	110.4	97.5	111.5	94.4	111.8	92.6
Rubber prod. payrolls *i*	136.6	111.1	141.0	102.0	138.3	99.5
Dyeing and fin. employment *i*	135.8	134.3	133.1	132.0	135.1	128.6
Dyeing and fin. payrolls *i*	142.3	121.0	132.4	113.5	135.9	111.4
MISCELLANEOUS:						
Oils & Fats Index ('26 = 100)[1]	......	......	136.9	......	140.9	48.6
Gasoline prod., *p*	......	......	......	......	63,288	52,907
Cottonseed oil consumpt., bbls.	......	......	......	......	297,353	317,548
PAINT, VARNISH, LACQUER, FILLERS:						
Sales 680 establishments, dollars	......	......	$41,367,698	$31,892,256	$51,138,488	$39,179,174
Trade sales (580 estbts.) dollars	......	......	$18,804,182	$15,115,083	$24,724,475	$19,638,441
Industrial sales, total, dollars	......	......	$18,726,637	$14,048,944	$21,453,628	$15,953,121
Paint & Varnish, employ. *i*	142.3	126.0	142.7	125.9	144.0	125.1
Paint & Varnish, payrolls *i*	174.1	138.7	171.7	135.7	173.7	135.8

a Bureau of Mines; *b* Crude and refined plus motor benzol, Bureau of Mines; *c* Based on 1 lb. of gun cotton to 7 lbs. of solvent, making an 8-lb. jelly; *d* 000 omitted, Bureau of Foreign & Domestic Commerce; *e* Expressed in equivalent tons of 16% A.P.A.; *f* 000,000 omitted at end of month; *i* U. S. Dept. of Labor, 3 year average, 1923-25 = 100, adjusted to 1937 Census totals; *j* 000 omitted. 37 states; *p* Thousands of barrels, 42 gallons each; *q* 680 establishments, Bureau of the Census; *r* Classified sales, 580 establishments, Bureau of the Census; *s* 53 manufacturers, Bureau of the Census, in millions of lbs.; *t* 387 identical manufacturers, Bureau of the Census, quantity expressed in dozen pairs; *v* In thousands of bbls., Bureau of the Census; ** Indices, Survey of Current Business, U. S. Dept. of Commerce; *z* Units are millions of lbs.; ‡ 000 omitted; * New series beginning March, 1940; [1] Revised series beginning February, 1940.

Hercules Report for Year

For the year ended December 31, 1941, Hercules Powder Company reported earnings of $6,098,712 after all charges including excess profits taxes. After payment of $524,928 dividends on preferred stock, net earnings applicable to the common stock were equal to $4.23 a share on 1,316,710 shares outstanding. The reported earnings were after the provision of an additional reserve of $500,000 for contingencies arising from the war.

In 1940 net earnings of the company were $5,807,769, equal after preferred dividends to $4.01 a share on 1,316,710 shares of common stock then outstanding.

Earnings Statements Summarized

Company	Annual dividends	Net income 1941	Net income 1940	Common share earnings 1941	Common share earnings 1940	Surplus after dividends 1941	Surplus after dividends 1940
Abbott Laboratories: Year, December 31	$2.15	$2,245,811	$2,239,408	$2.90	$2.89	......	......
Atlantic Refining Co.: Year, December 31	y2.00	14,346,229	6,217,453	5.16	2.11	$8,426,233	$2,961,454
Climax Molybdenum Co.: Year, December 31	3.20	8,954,104	6,039,373	3.55	2.40	890,104	495,373
Commercial Solvents Corp. Year, December 31	.55	2,615,452	2,387,321	.99	.90	1,165,169	1,728,102
Corn Products Refining: Year, December 31	3.00	10,266,027	9,581,054	3.37	3.10	955,861	270,888
du Pont de Nemours & Co., E. I.: Year, December 31, ...	y7.00	90,401,470	86,945,173	j7.50	j7.23	5,348,997	2,040,425
Formica Insulation Co.: Year, December 31	y1.75	462,365	375,725	2.82	2.29	......	......
General Aniline & Film: Year, December 31	kb.30	4,115,731	4,106,057	b.56	b.55	......	......
Goodrich, B. F., Co.: Year, December 31	2.00	8,608,324	6,121,357	5.02	3.11	3,941,659	3,409,574
Interchemical Corp.: Year, December 31	k2.00	2,136,110	1,107,027	6.01	2.47	......	......
Harbison-Walker Refractories Co.: Year, December 31	k1.50	2,608,813	2,513,935	1.81	1.71	391,338	635,331
Lindsay Light & Chemical Co.: Year, December 31	k.75	107,114	94,431	1.49	1.28	......	......
McKesson & Robbins, Inc.: Six months, December 31	w.25	3,957,543	......	2.27	....	3,406,362	......
Molybdenum Corp.: Year, December 31	k.50	511,154	769,991	.88	1.33	......	......
Monroe Chemical Co.: Year, December 31	f...	103,521	91,584	.31	.21†	......	......
Monsanto Chemical Co.: Year, December 31	k3.00	6,769,435	5,467,774	4.90	4.04	......	......
National Gypsum Co.: Year, December 31	.40	1,533,815	1,565,196	....	....	......	......
National Lead Co.: Year, December 31	k.62½	5,375,685	6,102,702	1.10	1.34	1,475,694	1,433,167
National Oil Products Co.: Year, December 31	k1.95	887,273	704,967	h4.11	h3.92	......	......
Norwich Pharmacal Co.: Year, December 31	k.90	788,013	757,883	.99	.95	71,080	d39,995
Sharp & Dohme, Inc.: Year, December 31	k.20	1,690,146	1,174,902	1.14	.48	733,023	373,105
Texas Gulf Sulphur Co.: Year, December 31	y2.50	9,015,775	9,140,887	2.35	2.38	d584,225	d459,113
United Carbon Co.: Year, December 31	3.00	1,711,547	1,336,331	4.30	3.36	517,892	142,676
United Chemicals, Inc.: Fifty-three weeks, Jan. 3	f...	294,156	aa170,751	....	....	......	......
United Drug Inc.: Year, December 31	f...	2,527,424	1,103,945	1.80	.79	......	......
Vick Chemical Co.: Six months, December 31	y3.00	1,827,101	1,951,881	2.68	2.86	......	......
Victor Chemical Works: Year, December 31	k1.40	1,187,224	1,090,223	h1.58	h1.57	......	......
Westvaco Chlorine Products Corp.: Fifty-three weeks, Jan. 3	y1.85	1,296,164	cc1,316,401	2.92	2.96	562,701	266,419

a On Class A shares; *b* On Class B shares; *c* On Combined Class A and Class B shares; *d* Deficit. *f* No common dividend; *j* On average number of shares; *k* For the year 1940; *b* On Preferred stock; On Class A shares; *y* Amount paid or payable in 12 months to and including the payable date of the most recent dividend announcement; ‡ Indicated quarterly earnings as shown by comparison of company's reports for the 6 and 9 months periods; § Plus extras; *n* Preliminary statement; *h* On shares outstanding at close of respective periods. ** Indicated quarterly earnings as shown by comparison of company's reports for 1st quarter of fiscal year and the six months period. ‡‡ Indicated earnings as compiled from quarterly reports. † Net loss. * Not available. ¶¶ Before interest on income notes. *x* Paid on or declared in last 12 months plus extra stock. *w* Last dividend declared, period not announced by company.

Price Trend of Representative Chemical Company Stocks

	Jan. 31	Feb. 7	Feb. 14	Feb. 21	Feb. 28	Net gain or loss last mo.	Price on Mar. 1 1941	1942 High	1942 Low
Air Reduction Co.	35⅝	35¼	34½	33½	33⅝	— 2	38½	38¼	32⅛
Allied Chemical & Dye Corp.	139¼	138	135¾	130½	130	— 9¼	146½	149	127½
Amer. Agric. Chem.	22	23	22⅞	23¼	22¾	+ ¾	15	23⅝	21
Amer. Cyanamid "B"	36¼	34¾	34½	34⅜	34½	— 1¾	34⅛	42⅜	31
Columbian Carbon	72½	70¼	71½	70½	69¾	— 2¾	77	72	60
Commercial Solvents	9⅞	8⅞	8⅞	8½	8½	— 1⅜	9⅛	9¾	8⅛
Dow Chemical Co.	115	112¾	114	109⅜	110	— 5	124	124¼	107½
du Pont	127	124¾	122	116	119	— 8	144¾	144	111½
Hercules Powder	68½	67	65¾	62¼	61¾	— 6¾	69⅞	72	58½
Mathieson Alkali Works	28½	27	26¾	26⅝	26⅝	— 1⅞	26¾	29½	25⅛
Monsanto	82¼	77	74½	72¼	71	—11¼	80	91	70⅛
Standard Oil of N. J.	40⅛	39⅞	40	36	37⅛	— 3	34⅜	42¼	33⅞
Texas Gulf Sulphur	34¼	34⅛	33¼	33⅜	33½	— ¾	35⅞	34⅞	31½
Union Carbide & Carbon ...	66⅜	65¾	65¼	64	64½	— 1⅞	65	74¾	63
United Carbon Co.	42⅜	41¾	40⅝	41½	42¾	+ ⅜	..	42⅞	37½
U. S. Industrial Alcohol ...	32½	32	30⅝	31¼	30¾	— 1¾	24	34¼	28½

Dividends and Dates

Name	Per Share	Stock Record	Payable
Abbott Laboratories, 4½% pref. (quar.)	1.00	4-1	4-15
Abbott Laboratories, Com., (quar.) ...	.40	3-16	3-31
Extra	.10	3-16	3-31
4½% pref. (quar.)	1.00	2-18	4-15
Allied Chemical & Dye (quar.)	1.50	3-6	3-20
American Agricultural Chem. Co.	.30	3-16	3-31
Amer Cyanamid Co. Class A, (quar.)	.15	3-12	4-1
Class B, (quar.)	.15	3-12	4-1
5% cum. pref. (quar.)	.125	3-12	4-1
Clorox Chemical Co. (quar.)	.75	3-13	3-25
Comm'l Alcohols, Ltd. 8% pref. (quar.)	.10	3-31	4-15
Diamond Alkali Co. (quar.)	.50	2-28	3-12
du Pont (E. I.) de Nemours & Co. Common reduced	1.25	2-24	3-14
$4.50 pref. (quar.)	1.125	4-10	4-25
Durez Plastics & Chem. Com. (irregular)	.50	2-24	3-14
6% pref. (quar.)	.375	2-24	3-14
Harshaw Chemical Co. (quar.)	1.75	3-31	4-15
Hercules Powder Co.	.60	3-13	3-25
Merck & Co. Common	.25	3-20	4-1
5¼% pref. (quar.)	1.31¼	3-20	4-1
4½% pref. (initial)	1.36¼	3-20	4-1
National Lead Co. Common	.125	3-13	3-31
7% pref. A (quar.)	1.75	2-27	3-14
6% pref. B (quar.)	1.50	4-17	5-1
Newport Industries Irregular	.20	3-6	3-26
Squibb, E. R., & Sons, Common	.625	3-11	3-14
Union Carbide & Carbon Corp.	.75	3-12	4-1
United Carbon Co. ..	.75	3-16	4-1
U. S. Gypsum Co. Com. (quar.)	.50	3-14	4-1
7% pref. (quar.)	1.75	3-14	4-1
U. S. Potash, Common	.50	3-9	3-23
6% pref. (quar.)	1.50	3-2	3-16
Victor Chem. Works	.30	3-21	3-31

Texas Gulf Sulphur Earns $9,015,775

Texas Gulf Sulphur Co. in report for year ended December 31, 1941, shows net profit of $9,015,775 after depreciation, amortization, provision for contingencies, federal income and excess profits taxes, etc., equal to $2.35 a share on 3,840,000 no-par shares of capital stock.

This compares with $9,140,887 or $2.38 a share in 1940.

Interchemical Earns $6.01 A Share

Interchemical Corp. and wholly-owned subsidiaries in report for year ended December 31, 1941, show net profit from operations of $2,136,110 after depreciation, interest, provision of $1,620,000 for federal income and excess profits taxes and reserve of $500,000 for contingencies, etc., but before extraordinary charges and credits. Above net is equal after 6% preferred dividends, to $6.01 a share on 290,320 no-par shares of common stock.

In year 1940 net profit was $1,107,027 after charges and provision of $600,000 for federal taxes on income. Net for that year was equal to $2.47 a common share.

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Chemical Finances
February, 1942—p. 101

Chemical Stocks and Bonds

PRICE RANGE 1941 February Last	1941 High	1941 Low	1941 High	1941 Low	1940 High	1940 Low	Stocks	Par $	Shares Listed	Dividends 1941*	Earnings** $-per-share-$ 1941	1940	1939
NEW YORK STOCK EXCHANGE													
44⅜	49⅞	45	55¾	46	70¼	49¼	Abbott Labs.	No	755,204	1.60	...	2.89	2.61
33⅝	38¼	32½	45	34⅝	58⅛	36½	Air Reduction	No	2,711,137	2.00	...	2.38	1.98
130	149	128½	167½	135	182	135½	Allied Chem. & Dye	No	2,401,288	6.00	...	9.43	9.50
22⅛	23⅝	21	22⅞	14⅜	21	12⅛	Amer. Agric. Chem.	No	627,981	1.45	...	1.45	1.22
8⅛	9¾	8	9⅞	4⅝	8¼	4⅛	Amer. Com. Alcohol	No	280,934	...	...	.22	—.38
33⅛	35	26	35	26	35½	23	Archer-Dan.-Midland	No	545,416	1.85	...	5.71	3.82
59¼	72¼	59¼	72¼	61	80½	57	Atlas Powder Co.	No	254,827	4.50	6.13	5.71	3.82
113	116	113	121	111	124¾	112½	5% conv. cum. pfd.	100	68,597	5.00	...	26.01	18.94
19¾	21¼	18	29¾	18½	35½	20	Celanese Corp. Amer.	No	1,112,788	2.00	...	3.38	3.53
116	120⅜	115	122⅛	116¾	121	105½	prior pfd.	100	164,818	7.00	...	38.69	38.67
12⅛	13⅝	12⅛	16¼	10⅞	20	10⅛	Colgate-Palm.-Peet	No	1,962,087	0.50	...	1.72	2.74
69¾	71	66½	83	64	98¾	71	Columbian Carbon	No	537,406	4.70	...	5.71	5.32
8½	9¾	8⅛	11⅞	7½	16⅝	8	Commercial Solvents	No	2,636,878	0.55	.99	.91	.61
52⅞	55¾	51¾	55¾	42¼	65⅛	40¼	Corn Products	25	2,530,000	3.00	3.37	3.10	3.32
173	174	164	182½	164	184	165	7% cum. pfd.	100	245,738	7.00	...	7.23	7.70
18	21	14	21	12¼	23¼	12½	Devoe & Rayn. A.	No	95,000	1.00	7.08	1.14	2.08
109½	124¼	108⅜	141¾	111⅛	171	127¼	Dow Chemical	No	1,135,187	3.00	...	6.65	3.76
119	144	115⅝	164¾	125⅛	189¼	146½	DuPont de Nemours	20	11,065,762	7.00	7.50	7.23	7.70
124½	126½	121	127	120⅞	129⅜	114	4½% pfd.	No	1,688,850	4.50	...	51.48	52.25
130¼	141	129¾	145½	120¼	166¾	117	Eastman Kodak	No	2,488,242	6.00	...	7.96	8.55
173	176	171	182½	160	180	155	6% cum.	100	61,657	6.00	...	325.62	337.65
35¼	38¾	35	41	32½	39¼	24¾	Freeport Sulphur	10	796,380	2.00	3.95	3.81	2.76
5⅛	5¾	5⅛	7½	4⅞	10	5½	Gen. Printing Ink	1	735,960	0.65	...	.86	.94
14	14⅝	12½	17⅞	11	19¾	11	Glidden Co.	No	829,989	1.50	...	1.56	1.70
41½	44	37¾	46	35	45	30	4½% cum. pfd.	50	199,940	2.25	...	8.64	9.27
83	93½	83	96	76	113¼	89⅞	Hazel Atlas	25	434,409	5.00	6.63	5.98	6.60
61¾	72	61½	80¼	65¼	100½	69	Hercules Powder	No	1,316,710	3.00	4.23	4.01	3.65
127	132½	123½	132½	123½	133½	126¼	6% cum. pfd.	100	96,194	6.00	...	66.38	60.87
26⅞	27	24⅞	29⅞	20¾	29	16⅜	Industrial Rayon	No	759,325	2.50	3.04	3.51	1.77
22	33½	19¾	27	19	47⅝	21¼	Interchem.	No	290,320	1.60	6.01	2.47	4.10
109¾	111½	108½	113¼	107	113	91	6% pfd.	100	65,661	6.00	...	16.99	24.27
1¾	2⅜	1⅝	2⅜	1	2½	1	Intern. Min. & Ch.	No	436,048	...	...	—1.57	—1.32
55½	60	48	53½	30⅛	44	18⅛	7% cum. pfd.	100	100,000	...	...	.14	1.26
27⅜	28¾	26⅛	31⅜	23	38⅞	19⅜	Intern. Nickel	No	14,584,025	2.00	...	2.30	2.39
47⅞	48¼	45½	49	38¼	39⅝	26⅞	Intern. Salt	No	240,000	3.00	3.76	3.98	1.92
19½	20¾	18½	22	17¼	23¾	14⅜	Kellogg (Spencer)	No	509,213	1.70	...	...	1.39
21¼	23⅝	20½	45⅜	19⅛	53⅜	30	Libbey Owens Ford	No	2,513,258	3.50	...	3.97	3.21
14	15½	12⅝	16⅝	13	18⅝	10⅛	Liquid Carbonic	No	700,000	1.00	...	1.72	1.62
26⅝	29½	26½	31¼	24⅛	32¾	21	Mathieson Alkali	No	828,171	1.50	1.90	1.72	1.12
71	91	70⅛	94	77	119	79	Monsanto Chem.	No	1,241,816	3.00	4.90	4.04	3.81
115	118½	117	118½	112	119	110	4½% pfd. A.	No	50,000	4.50	...	57.38	54.29
118½	118½	117½	123	115	122	113½	4½% pfd. B.	No	50,000	4.50	...	57.38	54.29
109½	113½	108¾	113½	108⅞	...	...	4½% pfd. C.	No	50,000	4.50	...	...	...
14⅝	16¼	13⅜	19¼	12¼	22½	14⅛	National Lead	10	3,090,664	0.50	1.10	1.34	1.23
168	176	160½	176	100½	176	160	7% cum. "A" pfd.	100	213,793	7.00	...	28.54	27.04
130	146	130	154	138	153¾	132	6% cum. "B" pfd.	100	103,277	6.00	...	59.46	55.30
34	36	26	36	26	44	28¾	National Oil Products	4	179,829	1.95	4.11	3.92	3.89
9⅝	11⅜	8⅛	11⅞	5⅜	14¼	6⅛	Newport Industries	1	621,359	0.75	...	0.50	0.66
47	54	45½	54	38¾	64⅝	42	Owens-Illinois Glass	12.50	2,661,204	2.50	3.40	2.71	3.17
45	52	42	61½	47½	71¾	53	Procter & Gamble	No	6,409,418	2.00	...	4.37	3.80
117	117	115	120	115	118½	112½	5% pfd.	100	169,517	5.00	...	336.78	298.55
12¼	14¾	11⅝	16¾	10⅛	13⅛	7⅝	Shell Union Oil	No	13,070,625	1.00	...	1.05	0.77
24⅞	28½	22¼	35¼	18⅞	23¼	12¼	Skelly Oil	No	981,349	1.50	...	3.28	1.99
23½	27½	21	34⅛	24⅞	29	20¾	S. O. Indiana	25	15,272,020	1.00	...	2.20	2.24
37	42¼	34⅝	46⅞	33	46½	29⅞	S. O. New Jersey	25	27,278,666	1.00	...	4.54	3.27
8⅝	9⅜	8	9⅜	6	9¼	4¼	Tenn. Corp.	5	853,696	1.00	...	1.36	0.41
34¼	39¼	33	46⅜	34½	47⅝	33	Texas Corp.	25	10,876,882	2.00	...	2.90	3.02
33½	34⅞	32⅞	38⅞	30⅛	37¼	26⅞	Texas Gulf Sulphur	No	3,840,000	2.50	...	2.38	2.04
64½	74¾	63¼	79⅞	60	88⅜	59⅞	Union Carbide & Carbon	No	9,277,288	3.00	...	4.55	3.86
42¾	47⅞	37½	52	35	65⅝	42½	United Carbon	No	397,885	3.00	...	3.36	3.81
30¾	34¼	29½	34¼	20	28	14	U. S. Indus. Alcohol	No	391,238	1.00	...	2.73	1.06
17¾	20⅞	17¾	34⅛	15½	43⅞	25	Vanadium Corp. Amer.	No	425,708	1.50	...	2.85	3.25
21	27¼	20	27¼	20	31½	14	Victor Chem.	5	696,000	1.40	...	1.45	1.59
1⅝	2⅛	1	2½	¾	4⅛	1¾	Virginia-Caro. Chem.	No	486,122	...	...	—1.36	—1.57
27¾	29½	22½	29½	18⅞	31¾	14	6% cum. part. pfd.	100	213,052	1.00	...	2.89	2.41
28	36½	27¼	36½	27¼	38½	27¾	Westvaco Chlorine	No	353,152	1.85	...	2.96	2.91
104¾	106½	103¼	112	105	109⅞	108	cum. pfd.	Nc	59,885	4.50	...	21.98	...
NEW YORK STOCK EXCHANGE													
34½	41⅞	33⅛	42⅜	31	39⅞	26	Amer. Cyanamid "B"	10	2,618,387	0.60	...	2.44	2.07
7	7¾	6⅜	7¾	6⅜	8⅛	5	Duval Texas Sulphur	No	500,000	1.25	...	1.16	1.25
75¼	99	65	99	65	92	60	Heyden Chem. Corp.	100	125,497	3.00	...	6.26	5.98
56	63	55¼	96¼	55	104	65	Pittsburgh Plate Glass	25	2,188,040	5.00	...	6.30	4.94
65½	70	62	84	61	100	62½	Sherwin Williams	25	638,927	3.00	...	6.57	5.96
113	113	110	115½	108⅛	114¾	106	5% cum. pfd.	50	122,289	5.00	...	39.49	35.08
PHILADELPHIA STOCK EXCHANGE													
141	185	135	185	162	192	158¾	Pennsylvania Salt	50	150,000	8.00	...	...	10.52

PRICE RANGE 1941 February Last	1941 High	1941 Low	1941 High	1941 Low	1940 High	1940 Low	Bonds	Date Due	Int. %	Int. Period	Outstanding $
NEW YORK STOCK EXCHANGE											
103⅝	104¼	101¾	104½	100¾	105¼	100⅛	Amer. I. G. Chem. Conv.	1949	5½	M-N	$22,400,000
34¼	42¼	34	42¼	26⅛	41	27½	Anglo Chilean Nitrate inc. deb.	1967	4½	J	10,400,000
35⅛	40	35	40	25⅝	39¾	27	Lautaro Nitrate inc. deb.	1975	4	J-D	27,200,000
97	97⅞	96½	99⅞	94¾	100¼	93½	Shell Union Oil	1954	2½	J-J	85,000,000
104	105⅝	103⅞	106⅝	102½	107	101⅛	Standard Oil Co. (New Jersey) deb.	1961	3	J-D	85,000,000
104½	104⅝	103⅝	150⅝	103	107	100⅝	Standard Oil Co. (New Jersey) deb.	1953	2¾	J-J	50,000,000
105⅛	105⅝	104½	107⅜	102⅞	108¼	102	Texas Corp.	1959	3	A-O	40,000,000

* Including extras paid in cash.
** For either fiscal or calendar year.

New Trade Marks of the Month

HYDROGEN PEROXIDE
393,614

FRANKLIN
393,621

CAREX
428,279

KAFA
439,015

HEALTHOL
439,174

FIRST NIGHTER
439,748

CAVIT
439,855

KONTAKT D.P.
443,489

NEO KONTAKT
443,492

DERFUR
443,925

CASCO
443,972

CROW
444,140

KITE
444,141

SWAN
444,142

VOLE
444,143

WHALE
444,144

DIAMANTE
444,488

M D D PERLES
445,288

QUICK CLEANER CLEANS CLEAN
446,048

PROTOWAX
446,148

STB Sal-T-Rub
446,636

RAYGRAM
447,669

RAYGRAM
447,671

KLORO-KLENZ
447,802

MARBLITE
447,883

HIGATON HIGATON
448,054

de-ox tube
448,068

VILACTO
448,080

Spring Morning
448,121

CANITE
448,135

GOLDEN GATE
448,152

SHEPHERD
448,155

448,183

TABSULE
448,331

ZEBRETTA
448,442

TYPE-X
448,471

K-7 (KAY-SEVEN)
448,532

CEL-ETS STRONG, COBB & CO.
448,534

CHARLAB
448,670

ZIM
448,680

Co-Ro-Lite
448,754

Carbonite SMOKELESS FUEL
448,765

L. ON-ANTS.
448,867

Trade Mark Descriptions †

393,614. Pennsylvania Salt Manufacturing Co., Philadelphia, Pa., Feb. 4, '41; for hydrogen peroxide; since Dec. 24, '40.

393,621. Franklin Lins de Albuquerque, Salvador Brazil, Oct. 8, '41; for ouricury wax; since Feb. '39.

428,279. Constructions et Applications Radio-Electrolytiques, Paris, France, Feb. 6, '40; for antiseptic solution containing hypochlorite of sodium; since Jan. 11, '39.

439,015. De Toledo Freres S. A. Pharmacie Principale, Geneva, Switzerland; Dec. 19, '40; for analgetic pharmaceutical products; since Jan. 1912.

439,174. Philadelphia, Magnesia Co., Philadelphia, Penna.; Dec. 24, '40; for mineral oil used in the treatment of constipation; since 1928.

439,748. Campana Corporation, Batavia, Ill.; Jan. 17, '41; for toilet preparations—astringents; since Nov. 27, '30.

439,855. Bohme Pettchemie G. m. b. H.; Chemnitz, Germany; Jan. 22, '41; for wetting finishing, dyeing, washing, and bleaching agents in the textile and leather industry; since Mar. 1, '39.

443,489. Emery Industries, Inc., Cincinnati, O.; May 12, '41; for fat splitting reagents and saponifiers; since 1920.

443,492. Emery Industries, Inc. Cincinnati, O.; May 12, '41; for fat splitting reagents and saponifiers; since '30.

443,925. Dernburg Fur Company, Inc., Chicago, Ill.; May 26, '41; for compounds used in the treatment of furs; since Apr. 16, '41.

443,972. Casco Products Corp., Bridgeport, Conn.; May 27, '41; for abrasive wheels; since Dec. 4, '39.

444,140,-141,-142,-143,-144. Ellison Insulations Ltd., Perry Barr, Birmingham, England; June 3, '41; for materials made wholly or in part from synthetic resinoids; since Jan. 8, '36.

444,488. David Mas de Roda y Bernal, Barcelona, Spain; June 13, '41; for perfumery; since July '35.

445,288. The G. F. Harvey Company, Saratoga Springs, N. Y.; July 12, '41; for pharmaceutical preparation—namely, vitamin capsules; since June 23, '41.

446,048. General Brands Corp., New York N. Y.; Aug. 7, '41; for general household cleaning and polishing preparation; since Mar. 22, '41.

446,148 L. Sonneborn Sons, Inc., New York, N. Y.; Aug. 11, '41; for waxy hydrocarbon material; Feb. 15, '41.

446,636. Sal-T-Rub Company, Minneapolis, Minn.; Aug. 28, '41; for rubbing mixture for mechanical stimulation of the skin; since July 25, '41.

447,669. Raygram Corporation, New York, N. Y.; Oct. 10, '41; for photographic chemicals; since 1932.

447,671. Raygram Corporation, New York, N. Y.; Oct. 10, '41; for photographic developers and fixer hardeners; since July, 1938.

447,802. Federated Foods, Inc., also as (Federated Foods) Chicago, Ill.; Oct. 15, '41; for household bleach; since May 23, '41.

447,883. Ralph Barker Lester (Barker Chemical Company) New York, N. Y.; Oct. 17, '41; for cleaning material; since April, '40

448,054. The Knox Company, Los Angles, Calif.; Oct. 23, '41; for medicinal preparations; since July 16, '41.

448,068. Isreal W. Wilenshik (Metallurgical Products Company) Philadelphia, Penna.; Oct. 23, '41; for deoxidizing, degasifying, and desulfurizing agents; since Sept. 15, '41. and desulfurizing agents used in the metallurgical art to produce gas free and oxide free alloys; since Sept. 15, '41.

448,080. Herman A. Heinemeyer, Roselle Park, N. J.; Oct. 24, '41; for food nutrient having therapeutic properties; since Sept. 3, '41.

448,121. The C.-S. Welch Company, New York, N. Y.; Oct. 25, '41; for detergent liquid; since May 8, '41.

448,135. Godchaux Sugars, Inc.; New Orleans, La.; Oct. 27, '41; for plastic molding compounds in powdered form; since Sept. 30, '41.

448,152. Lockport Cotton Batting Company, Lockport, N. Y.; Oct. 27, '41; for wool batting or wool batts; since Oct. 30, '35.

448,155. Lockport Cotton Batting Co., Lockport, N. Y.; Oct. 27, '41; for wool batting or wool batts; since Nov. 4, '40.

448,193. Frieda L. Johnson (Johnson Products Company) New York, N. Y.; Oct. 28, '41; for all-purpose fabric mender; since Sept. '40.

448,331. Oxford Products, Inc., Cleveland, O.; Nov. 1, '41; for vitamin preparations; since June 2, '41.

448,442. Strong & Fisher Limited, Rushden, England; Nov. 6, '41; for leather; since July 31, '41.

448,471. Charles Ederer, New York, N. Y.; Nov. 8, '41; for preparation for cleaning the type of typewriters and general office machines; since May 21, '41.

448,532. Edward A. Spare (Douglas Miller Company) Camden, N. J.; Nov. 10, '41; for tablet for headaches; since Dec. 10, '40.

448,534. Strong Cobb & Co., Inc. Cleveland, O.; Nov. 10, '41; for vitamin preparations; since Oct. 6, '41.

448,670. Charlotte Chemical Laboratories, Inc., Charlotte, N. C.; Nov. 15, '41; for organic amine compound; since Apr. 10, '41.

448,680. Pawling Refining Corp.; Port Chester, N. Y.; Nov. 15, '41; for degumming, desludging, motor cleaning preparation; since March '41.

448,754. Columbian Rope Company, Auburn, N. Y.; Nov. 19, '41; for resin-impregnated needled felted vegetable fiber material; since Oct. 25, '41.

448,765. Midwest-Radiant Corp., St. Louis, Mo.; Nov. 19, '41; for processed coal fuel; since Oct. 14, '41.

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† Trademarks reproduced and described include those appearing in the *Official Gazette* of the *U. S. Patent Office,* Feb. 3 to March 3, 1942.

New Trade Marks of the Month

RADLEY'S COCCIDIOSINE
448,873

Bathfresh
448,874

448,975

CAPHOSTEROL-C
448,993

Schiaparelli
449,059

CHEMADE
449,088

Nopco 800
449,148

SENTINEL
449,227

449,228

Vimms
449,233

Fractol
449,241

GOOD MORNING
449,242

FrigerBar ABSORBS FOOD ODORS
449,260

CHINAROID
449,281

BECOMVITE
449,358

COMBEVITE
449,359

PROPADRINA
449,360

VANZAK
449,363

DRUMLIN
449,411

VITAMINETTES
449,456

COBEX
449,460

DYNA-CAPS
449,461

Ultra-Caps
449,462

KAFY
449,534

PHILGLOS
449,585

PERDIPIGEN
449,617

THIAMULSION
449,642

VEROCALATE
449,649

AGORAL
449,656

PARABO
449,664

MULTIZYME
449,708

AVCONIT
449,731

AVCOWEVE
449,732

GLIDDOL
449,735

CASH
449,760

Viteen
449,774

BENAPLEX
449,786

IROVITE
449,800

MEKLEEN
449,837

Avalon
449,859

AVALON
449,860

OPTI-KAPS
449,876

V-KAPS
449,877

VIOPTAMIN
449,878

BRADLEY'S
449,886

GOLDEN GLOW
449,911

MELARSEN
450,315

VITA-QUINT
450,077

448,873. Mamie Radley (Mrs. J. W. Radley), Houston, Texas; Nov. 24, '41; for poultry preparation; since Apr. 1, '41.
448,874. Schratz, Inc., Detroit, Mich.; Nov. 24, '41; for bath crystals and oils; since Nov., '31.
448,867. Wm. B. Lingo (Medical Supply Company) St. Petersburg, Fla.; Nov. 24, '41; for insecticides; since June 3, '41.
448,975. Lambert Pharmacel Company, Wilmington, Del.; Nov. 27, '41; for saponaceous paste; since Jan. 1938.
448,993. William R. Warner & Co., Inc.; New York, N. Y.; Nov. 27, '41; for calcium diphosphate preparation containing vitamins; since Nov. 18, '41.
449,059. Parfums Schiaparelli, Inc., New York, N. Y.; Nov. 29, '41; for soaps; since July 10, 1937.
449,088. Clifford F. Wilcox (The Chemade Company), Los Angeles, Calif.; Dec. 1, '41; for diuretic antacid alkaline compound; since June 1, '41.
449,148. National Oil Products Company, Harrison, N. J.; Dec. 3, '41; for fish oil or fish liver oil; since Sept. '41.
449,227. Forest City Products, Inc., Cleveland, O.; Dec. 6, '41; for vitamin tablets; since Nov. 18, '41.
449,228. Forest City Products, Inc., Cleveland, O.; Dec. 6, '41; for vitamin tablets; since Nov. 18, '41.
449,233. Lever Brothers Company, Cambridge, Mass.; Dec. 6, '41; for vitamin tablets; since 1935.
449,242. Staples Coal Company (City Fuel Company) Boston, Mass.; Dec. 6, '41; for coal; since Oct. 30, '41.
449,241. Stanco Inc., Wilmington, Del., and New York; Dec. 6, '41; for white oils; claims use on white oils used in the preparation of cosmetics, pharmaceutical and medicinal products since 1932; and on petroleum ether; since Mar. 30, '21.
449,260. The Frigeerbar Corporation, Kansas City, Mo.; Dec. 8, '41; for air purifying compound; since Oct. 28, '41.
449,281. The Knox Company, Los Angeles, Calif.; Dec. 8, '41; for medicinal preparation; since April 1, '30.
449,358,-359. Sharp & Dohme, Inc., Philadelphia, Pa.; Dec. 10, '41; for preparations for correction of metabolic deficiencies; since Dec. 1, '41.
449,360. Sharp & Dohme, Inc., Philadelphia, Pa.; Dec. 10, '41; for pharmaceutical preparations; since Oct. 23, '41.
449,363. R. T. Vanderbilt Company, Inc., New York, N. Y.; Dec. 10, '41; for extender for latex and dispersed rubber; since Dec. 2, '41.
449,411. Drumlin, Inc., New York, N. Y.; Dec. 12, '41; for herval compound for use in the care of the scalp and hair; since Dec. 6, '41.
449,456. Hoffmann-La Roche, Inc., Nutley, N. J.; Dec. 13, '41; for medicinal preparation containing vitamin; since Nov. 29, '41.
449,460,-461,-462. McKesson & Robbins, Inc., New York, N. Y.; for vitamin preparations; since Dec. 9, '41.
449,534.. Amalgamated Leather Companies, Inc., Wilmington, Del.; Dec. 17, '41; for leather; since Oct. 1, '41.
449,585. Phillips Petroleum Company, Bartlesville, Okla.; Dec. 18, '41; for oil dressing for hair; since Mar. 19, '41.
449,617. Eli Lilly and Company, Indianapolis, Ind.; Dec. 19, '41; for medicinal preparation; since Nov. 10, '41.
449,642. Detail Products Company, St. Louis, Mo.; Dec. 20, '41; for emulsion of mineral oil with thiamin chloride; since Dec. 1, '41.
449,649. Marcy Laboratories, Inc., New York, N. Y.; Dec. 20, '41; for cholagogue evacuant; since Dec. 3, '41.
449,656. William R. Warner & Co., Inc., New York, N. Y.; Dec. 20, '41; for medicinal preparation; since Dec. 3, '41.
449,664. The R. H. Bogle Company, Alexandria, Va.; Dec. 22, '41; for moth destroyer preparation; since Mar. 24, '33.
449,708. Wallerstein Company, Inc., New York, N. Y.; Dec. 22, '41; for mixture of enzymes for analytical and industrial purposes; since Dec. 12, '41.
449,731. American Viscose Corp., Wilmington, Del.; Dec. 24, '41; for conditioning media for yarns, threads and filaments; since Dec. 9, '41.
449,732. American Viscose Corp., Wilmington, Del.; Dec. 24, '41; for conditioning media for yarns, threads, and filaments; since Dec. 9, '41.
449,735. The Glidden Company, Cleveland, O.; Dec. 24, '41; for phosphatides; since August, '40.
449,760. Calcium Sulfide Corp., Damascus, Va.; Dec. 26, '41; for calcium hydrosulfide; since Nov. 10, '41.
449,774. Lanteen Medical Laboratories, Inc., Chicago, Ill.; Dec. 26, '41; for vitamin preparation; since Dec. 15, '41.
449,786. Smith, Kline & French Laboratories, Philadelphia, Pa.; Dec. 26, '41; for general tonic; since Dec. 4, '40.
449,800. Dr. D. Hayne & Son, Inc., Philadelphia, Penna, Dec. 27, '41; for medicinal preparations; since Nov. 20, '41.
449,837. General Chemical Company, New York, N. Y.; Dec. 29, '41; for metal polish in paste form; since Oct. 24, '41.
449,859. The Kroger Grocery & Baking Company, Cincinnati, O.; Dec. 30, '41; for wallpaper cleaner, glass cleaner and soap flakes; since Mar. 22, '32.
449,860. The Kroger Grocery & Baking Company, Cincinnati, O.; Dec. 30, '41; for sal soda, chlorite, and water softener; since Aug. 12, '32.
449,876,-877,-878. Abbott Laboratories, North Chicago, Ill.; Dec. 31, '41; for vitamin preparations; since Dec. 10, '41.
449,886. Milton Bradley Company, Springfield, Mass.; Dec. 31, '41; for adhesives; since July 18, '20.
449,911. H. J. Mayer & Sons Company, Chicago, Ill.; Dec. 31, '41; for compound or preparation for curing preserved meats; since June 10, '41.
450,077. Premo Pharmaceutical Laboratories, Inc., New York, N. Y.; Jan. 8, '41; for vitamin capsules; since March, '37.
450,315. Parke, Davis & Company, Detroit, Mich.; Jan. 19, '41; for preparation for the treatment of certain types of syphillis and related infections; since Dec. 22, '41.

Summary of War Regulations

There are no more important subjects to the chemical industry today than priorities, allocations, import and price controls. Chemical Industries, last month, chronologically digested the important regulations up to Jan. 2, 1942. This month new regulations are brought up to Feb. 28, 1942. Next month and each month thereafter additional and revised regulations will be given.

By way of explanation a "P" order identifies a limited blanket rating given to a company, or an industry to facilitate the acquisition of scarce materials needed by such companies for defense or essential civilian production.

Distribution of commodities under industry-wide control generally is governed by "M" (material) orders, regulating distribution and flow of a given material into defense or essential civilian production channels.

Limits on the production of materials are covered by "L" limitation orders.

Acetyl Salicylic Acid

Feb. 7, 1942. OPA issues Price Schedule No. 99, effective Feb. 16, 1942.

Acetyl Salicylic Acid
Price Schedule No. 99
Effective February 16, 1942

1335,809 Appendix A—Maximum Prices for Acetyl Salicylic Acid.

(a) Sales by Producers and Primary Jobbers.

(1) The maximum prices for sale of acetyl salicylic acid by producers or primary jobbers are established as follows:

Quantity—	50 mesh powdered or 20-40 mesh crystals, per lb.
200 pounds or more in barrels	$.40
100 pounds or more in kegs	.40
25 pounds or more in drums	.41
5 pounds or more in 5 pound cartons	.54
1 pound or more in 1 pound cartons 1/	.56

Quantity—	any special mixture or formula per lb.
200 pounds or more in barrels	$.45
100 pounds or more in kegs	.45
25 pounds or more in drums	.46
5 pounds or more in 5 pound cartons 1/	.61

Quantity—	10 per cent starch granulation, per lb.
200 pounds or more in barrels	$.40
100 pounds or more in kegs	.40
25 pounds or more in drums	.41
5 pounds or more in 5 pound cartons	.54
1 pound or more in 1 pound cartons 1/	.56

Quantity—	16 per cent starch granulation, per lb.
200 pounds or more in barrels	$.38
100 pounds or more in kegs	.38
25 pounds or more in drums	.39
5 pounds or more in 5 pound cartons	.52
1 pound or more in 1 pound cartons 1/	.54

Quantity—	20 per cent starch granulation, per lb.
200 pounds or more in barrels	$.36
100 pounds or more in kegs	.36
25 pounds or more in drums	.37
5 pounds or more in 5 pound cartons	.50
1 pound or more in 1 pound cartons 1/	.52

1/ 3c per pound may be added for acetyl salicylic acid packaged in one pound canisters, and 8c per pound for acetyl salicylic acid packaged in one pound bottles.

(2) The above maximum prices are f. o. b. the producer's or primary jobber's shipping point, with freight equalized at the rate for a shipment of identical quantity over standard routes from the following points, viz.: New York City, New York; Philadelphia, Pennsylvania; Midland, Michigan; Chicago, Illinois; and St. Louis, Missouri. The maximum prices which a purchaser may pay for acetyl salicylic acid delivered to him from a producer's or primary jobber's shipping point shall not exceed the maximum prices listed above plus the transportation charge on a shipment of identical quantity to destination from that city named above from which the transportation rate to destination is least.

(b) Sales by Resellers.

The maximum prices for sales of acetyl salicylic acid by resellers are established as follows, f. o. b. reseller's shipping point.

Quantity—	Per pound (*)	(†)	(§)	(‡)	(¶)
200 lbs. or more in barrels	$.52	$.59	$.52	$.49	$.47
100 lbs. or more in kegs	.52	.59	.52	.49	.47
25 lbs. or more in drums	.52	.60	.52	.50	.48
5 lbs. or more in 5-lb. cartons	.70	.77	.70	.68	.65
1 lb. or more in 1-lb. cartons 2/	.73	.79	.73	.70	.68

* 50 mesh powdered or 20-40 mesh crystals. † Any special mixture or formula. § 10 per cent starch granulation. ‡ 16 per cent starch granulation. ¶ 20 per cent starch granulation.

2/4c per pound may be added for acetyl salicylic acid packaged in one pound canisters and 9c per pound for acetyl salicylic acid packaged in one pound bottles.

(c) Export Sales and Sales to Persons in Territories and Possessions of the United States.

The following maximum prices are established for export sales of acetyl salicylic acid to persons in foreign countries and for sales to persons in the territories or possessions of the United States, where the shipment pursuant to such sales originates in the continental United States exclusive of Alaska:

(1) Exports and Sales by Producers and Primary Jobbers.

(i) The maximum prices, except for export sales to persons in Canada or Mexico, are the maximum prices listed in paragraph (a) of this Appendix, f. a. s. vessel at the port of shipment, plus 10 per cent of the applicable maximum price.

(ii) The maximum prices for export sales to persons in Canada or Mexico are the maximum prices listed in paragraph (a) of this Appendix, plus 5 per cent of the applicable maximum price, f. o. b. shipping point in case of overland shipments, or f. a. s. vessel at the port of shipment in case of shipment by vessel.

(2) Exports and Sales by Resellers.

(i) The maximum prices, except for export sales to persons in Canada or Mexico, are the maximum prices listed in paragraph (a) of this Appendix, f. a. s. vessel at the port of shipment, plus 40 per cent of the applicable maximum price.

(ii) The maximum prices for export sales to persons in Canada or Mexico are the maximum prices listed in paragraph (b) of this Appendix, plus 5 per cent of shipments, or f. a. s. vessel at the port of shipment in case of shipments by vessel.

(3) Expenses.

No expenses, commissions, or charges of services may be added to the maximum prices established in this paragraph (c), except (a) ocean or overland freight, (b) marine and war risk insurance, and (c) foreign agents' commission, unless such foreign agents' commission or any part thereof is received by the exporter directly or indirectly for his own use.

(d) Containers.

No charge for containers may be added to the maximum prices established by this Schedule, except as specifically provided above.*

Aluminum

Jan. 7, 1942. Segregation of aluminum scrap, by alloy content on form made mandatory by Supplementary Order M-1-d, issued by Priorities Division OPM. Supersedes aluminum scrap controls of Supplementary Order M-1-c and repeals A-10 preference ratings extended to smelters with defense orders.

Jan. 13, 1942. Plant scrap prices rearranged.

Jan. 27, 1942. Conservation Order M-1-e, effective immediately prohibits use of aluminum in any manufacture except on war contracts and items specifically set out in the order. Only exception is that aluminum authorized by Priorities Director after Oct. 31, 1941 and prior to effective date of this order may be used for specified purpose. Anhydrous aluminum chloride may be produced only for manufacture of dyes for war textiles, high octane gasoline, tear gas, nylon, or pharmaceuticals.

Jan. 31, 1942. War Production Board extends basic aluminum orders to Feb. 28, 1942 pending clarification of production situation.

Feb. 10, 1942. Suspension orders issued against three companies accused of receiving or delivering scrap in violation of priority orders.

In explaining order M-1-d WPB says responsibility for proper segregation of scrap lies with plant producing the scrap.

Feb. 17, 1942. WPB issues Supplementary Order M-1-f which brings into one order complete allocation control of aluminum. Replaces orders M-1 and M-1-a.

Feb. 24, 1942. WPB moves to acquire possession of all idle aluminum inventories in hands of fabricators.

Feb. 26, 1942. WPB Director of Materials announces program for annual production of 2,000,000,000 lb's.

Asbestos

Jan. 21, 1942. Conservation Order M-79 effective immediately, issued by Director of Priorities places South African Asbestos under strict priority control.

Feb. 28, 1942. 85% magnesia and other pipe covering permitted on ship installations where temperatures under 200°F. occur. WPB amends order M-79.

Jan. 26, 1942. Limitation order L-28 imposes sharp curtailment in consumption.

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Priorities, Allocations, Import and Price Controls—p. 17

War Regulations

Priorities, Allocations, Import and Price Controls—p. 18

Jan. 27, 1942. Supplement No. 1 to Copper Conservation Order M-9-c issued by WPB limits use of brass in shoe eyelets.

Jan. 30, 1942. New list of prices for brass and bronze issued by OPA effective Feb. 1, 1942.

Feb. 19, 1942. Amendment No. 4 to Price Schedule No. 20 (copper and copper alloy scrap) issued by OPA permits deliveries of brass scrap at contract prices under written contract entered into prior to Feb. 6, 1942 up until March 15, 1942.

Cadmium

Jan. 17, 1942. WPB order M-65 invoked. Priorities Regulation No. 1 directs all deliveries which are restricted to distributors on preference ratings of A-10 or higher, or on specific authorization of Priorities Director.

M-65-A prohibits use of cadmium in long list of articles.

OPA issued Price Schedule No. 71 for primary and secondary cadmium. Ceiling is 90 cents per lb. for sticks delivered at buyer's plant, and 95 cents for anodes and special shapes.

Carbon Tetrachloride

Jan. 29, 1942. OPA issued Price Schedule No. 79, effective Feb. 2, 1942. Fixes maximum prices for quantities of 5 gal. or more at the current level.

Chlorinated Rubber

Feb. 23, 1942. All stock of chlorinated rubber, except for specified purposes, frozen by amendment to General Preference Order M-46.

Chlorine

Jan. 27, 1942. Assurance by WPB that chlorine will be provided for water purification.

Feb. 27, 1942. Amendment to Order M-19 imposes drastic restrictions on consumption.

Chromium

Jan. 13, 1942. Control tightened by prohibiting the melting of more than 2 tons of ferrochrome in any one month without OPM permission.

Feb. 4, 1942. Amendment to order M-18-a places chromium under complete allocations system. M-18-a revokes order M-18, takes effect upon issuance, expires June 30, 1942.

Citric Acid

Feb. 7, 1942. OPA issues Price Schedule 101, effective Feb. 16, 1942.

Cobalt

Feb. 7, 1942. General Preference Order M-39 places cobalt under allocations.

Order M-39-b prohibits use of cobalt in all pigments after May 1, 1942, and restricts its use until that time to 40% of amount used in first six months of 1941.

Cocoanut Oil

Jan. 13, 1942. Cocoanut oil brought under General Imports Order M-63. All imports must be made by the Government agencies and supplies afloat sold to these agencies.

Copper

Jan. 2, 1942. M-9-a extended two weeks. Conservation order M-9-e interpreted.

Jan. 6, 1942. Order M-9-b revised to provide that no deliveries of copper or brass scrap may be made except to scrap dealer, or in case of brass mill scrap to a brass mill, with specific authorization by Priorities Director. Amended order revokes Order P-61.

Jan. 7, 1942. Privately imported copper placed under full priority by revision to General Preference Order M-9-a.

Jan. 12, 1942. Three chemical producers granted permission to pay prices higher than the established ceiling for specially prepared copper to meet rigid manufacturing requirements.

Jan. 13, 1942. Amendment to Conservation Order M-9-c removes "health supplies" from restrictions of the regulations.

Jan. 16, 1942. Manufacturers warned if they are using copper or copper base alloy in manufacture of articles on list "A" of Order M-9-c and have not filed Form PD-189 they are in direct violation of law and must file immediately.

Jan. 27, 1942. Supplement No. 1 to Copper Conservation Order M-9-e provides that between Jan. 1, 1942 and March 31, 1942 shoe eyelets may not be made in number greater than necessary to fill orders for deliveries before April 1. After March 31 no copper may be used in manufacture of shoe findings.

Jan. 28, 1942. Limitation Order L-28 curtails use of copper in manufacture of non-essential incandescent lamps.

Feb. 3, 1942. Deadline of Feb. 9, 1942

Carbon Tetrachloride

Price Schedule No. 79

Effective February 2, 1942

1335.609 Appendix A—Maximum Prices. The following maximum prices are established for carbon tetrachloride:

	Zone 1	Zone 2	Zone 3	Zone 4
	Prices Per Lb. Delv.			
(a) Tank Cars ..	\$.0525	\$.0575	\$.0675	\$.06
(b) Carload Lots	Prices Per Gal. Delv.			
(i) 50-55 gal. drums ..	\$.73	\$.80	\$.94	\$.83
(ii) 5 and 10 gal. cans ..	.97	1.04	1.17	1.07
(c) Less than Carload Lots—				
(i) 50-55 gal. drums ...	.80	.87	1.00	.90
(ii) 5 and 10 gal. cans ..	1.07	1.14	1.27	1.17

The above maximum prices apply to deliveries in the respective Zones, regardless of the Zone from which shipment is made.

(d) Export Sales and Sales to Territories and Possessions of the United States.

The following maximum prices are established for export sales of carbon tetrachloride to persons in foreign countries and for sales to persons in the territories or possessions of the United States where the shipments pursuant to such sales originate in the continental United States exclusive of Alaska:

(1) Shipments by Vessel.

The maximum prices for shipment by vessel are the maximum prices established by paragraphs (b) and (c) above for the Zone in which the port of shipment is located, f. a. s. vessel at the port of shipment, plus 6.5c per gallon.

(2) Overland Shipments.

(i) The maximum prices for overland shipments in tank cars, delivered to destination in Canada or Mexico, are the maximum prices established by paragraph (a) above for that Zone from which the shipment crosses the boundary into Canada or Mexico, plus \$.003 per pound, plus transportation charges over a standard route from seller's shipping point to destination, less transportation charges over such route from seller's shipping point to the station in the United States which is at or nearest to that point on the boundary at which the shipment crosses from the United States into Canada or Mexico.

(ii) The maximum prices for overland shipments in carload lots and less than carload lots delivered to destination in Canada or Mexico, are the maximum prices established by paragraph (b) and (c) above for that Zone from which the shipment crosses the boundary into Canada and Mexico plus \$.05 per gallon, plus transportation charges over a standard route from seller's shipping point to destination, less transportation charges over such route from seller's shipping point to the station in the United States which is at or nearest to that point on the boundary at which the shipment crosses from the United States into Canada or Mexico.

(3) Expenses.

(i) No expenses, commissions or charges for services may be added to the maximum prices established by subparagraphs (1) and (2) of this paragraph (d), except (i) ocean freight, (ii) marine and war risk insurance and (iii) foreign agent's commission unless the foreign agent's commission or any part thereof is received by the exporter directly or indirectly for his own use.

(e) Zones. When used in this Schedule, the term:

(1) "Zone 1" means the States of Connecticut, Delaware, Illinois, Indiana, Iowa, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, Tennessee, Vermont, Virginia, West Virginia, Wisconsin, District of Columbia and the cities of Omaha, Nebraska, and Kansas City, Kansas.

(2) "Zone 2" means the States of Alabama, Arkansas, Florida, Georgia, Kansas, Louisiana, Mississippi, Nebraska, North Dakota, Oklahoma, South Carolina and South Dakota, excepting the cities of Omaha, Nebraska and Kansas City, Kansas.

(3) "Zone 3" means the States of Colorado, New Mexico, Texas, Wyoming, and that part of Montana east of but not including the following counties: Toole, Pondera, Teton, Lewis and Clark, Broadwater and Gallatin.

(4) "Zone 4" means the States of Arizona, California, Idaho, Nevada, Oregon, Utah, Washington, and that part of Montana west of and including those counties mentioned above.

(f) Containers.

No charges for containers may be added to the maximum prices established above.

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for receiving Form PD-189 from manufacturers using copper or copper base alloy materials and parts under Section (a) (4) of Order M-9-c was set by WPB.

Feb. 6, 1942. Amendment to Order M-9-a copper and copper products may not be sold by mills, warehouses or foundries except on preference ratings of A-10 or higher.

Feb. 9, 1942. Premium prices for over quota production of U. S. mine operators of 17 cents per lb. for copper, 11 cents for zinc, and 9¼ cents for lead will be paid by Metals Reserve Co. for period of 2½ years beginning Feb. 1, 1942. Should emergency end before termination date, Metals Reserve Co. retains right to terminate arrangement on equitable terms.

Feb. 14, 1942. Preference Rating Order P-58 amended to provide wider assistance for South American mines in obtaining maintenance and operating supplies.

Feb. 19, 1942. Interpretation of Order M-9-a makes clear that order applies only to brass and copper warehouses as defined in Order M-9-a and deliveries of completed copper products designed for ultimate consumer are not included in the prohibitions of order.

Feb. 28, 1942. Conservation Order M-9-c amended.

Corundum

Feb. 10, 1942. General Preference Order M-89 establishes allocations system.

Cottonseed Oil

Jan. 21, 1942. Certain Texas and Arizona cottonseed mills ordered not to crush, sell or deliver any SXP American Egyptian cottonseed pending issuance of allocation order.

Jan. 24, 1942. Above mills allowed to sell above cottonseed to growers of such types, or to Commodity Credit Corp.; purchasers other than Commodity Credit Corp. can use seed only for such cotton or for growing additional seed.

Diphenylamine

Jan. 31, 1942. According to General Preference Order M-75, diphenylamine to go under complete allocation control Feb. 1, 1942.

Ethyl Alcohol

Jan. 8, 1942. Order M-69 provides that all distilleries to manufacture 190 proof ethyl alcohol from corn or grain shall, starting Jan. 15, use them only in production of that type of alcohol.

Jan. 24, 1942. Amendment No. 3 to General Preference Order M-30. (1) Definition of ethyl alcohol changed to indicate that alcohol for industrial purposes only is comprehended. Proprietary solvent is included in definition of this term. (2) Restrictions on receipts will henceforth be by calendar quarterly period, rather than by monthly periods. Restrictions on producer's deliveries, previously contained in order, are rescinded. (3) Certain orders, including those with an A-1-j or higher rating, may be filled without reference to quantity limitations. Quantities delivered under these orders shall be in addition to restricted quantities permissible. (4) Deliveries to Army and Navy, Lend-Lease countries and persons holding Internal Revenue permits for the acquisition of tax free alcohol are exempted from quantity and certificate requirements. Also exempted from provisions of the order are monthly deliveries of 5 cent gallons or less of ethyl or isopropyl alcohol, to any one person during one month.

Feb. 3, 1942. Order M-69 suspended until Feb. 8, 1942 because of lack of

Citric Acid
Price Schedule No. 101

Effective February 16, 1942

1335.859 Appendix A—Maximum Prices for Citric Acid.

(a) Sales by Producers and Primary Jobbers.

(1) Citric Acid Produced in the Continental United States.

(i) The maximum prices for sales by producers of primary jobbers of citirc acid produced in the continental United States are established as follows:

Quantity	U. S. P. granular, Per lb.	U. S. P. powder, Per lb.
Carload or more	$0.20	$0.205
10,000 lbs. or more in bbls.	.205	.21
200 to 10,000 lbs. in bbls.	.21	.215
100 lbs. or more in 100-lb. kegs or drums	.215	.22
50 lbs. or more, in 50-lb. drums or cartons	.23	.235
25 lbs. or more, in 25-lb. drums or cartons	.24	.245
5 lbs. or more, in 5-lb. containers	.29	.295

Quantity	U. S. P. anhyd'us granular, Per lb.	U. S. P. anhyd'us powder, Per lb.
Carload or more	$0.225	$0.23
10,000 lbs. or more in bbls.	.23	.235
200 to 10,000 lbs. in bbls.	.235	.24
100 lbs. or more, in 100-lb. kegs or drums	.24	.245
50 lbs. or more, in 50-lb. drums or cartons	.255	.26
25 lbs. or more, in 25-lb. drums or cartons	.265	.27
5 lbs. or more, in 5-lb. containers	.315	.32

(ii) The above maximum prices are f. o. b. the producer's or primary jobber's shipping point, with freight equalized at the rate for a shipment of identical quantity over standard routes from the following points, viz.: Boston, Massachusetts; Philadelphia, Pennsylvania; Baltimore, Maryland; New York City, New York; Portland, Oregon, and Seattle, Washington. The maximum prices which a purchaser may pay for citric acid delivered to him from a producer's or primary jobber's shipping point shall not exceed the maximum prices listed above plus the transportation charge on a shipment of identical quantity to destination from that city named above from which the transportation rate to destination is least.

(iii) The maximum prices for sales by producers or primary jobbers of citric acid produced in the United States and delivered from local stocks maintained in Chicago, Illinois, or St. Louis, Missouri, are the maximum prices listed above, plus one-half cent per pound, f. o. b. the warehouse in whichever city from which actual shipment is made.

(2) Citric Acid Produced in Territories of the United States.

The maximum prices for sales by producers or primary jobbers of citric acid produced in the territories of the United States are the maximum prices listed in subparagraph (i) of this paragraph (a), f. o. b. point of shipment in such territories.

(b) Sales by Resellers.

The maximum prices for sales of citric acid by resellers are established as follows, f. o. b. reseller's shipping point.

Quantity.	USP granular (Per Pound)	USP pwd. (Per Pound)	USP anhydro's granular (Per Pound)	USP anhydro's pwd. (Per Pound)
Carload or more	$0.26	$0.27	$0.29	$0.30
10,000 pounds or more in bbls.	.27	.27	.30	.31
200 to 10,000 lbs. in bbls.	.27	.28	.31	.31
100 lbs. or more in 100-lb. kegs or drums	.28	.29	.31	.32
50 lbs. or more in 50-lb. drums or cartons	.30	.31	.33	.34
25 lbs. or more in 25-lb. drums or cartons	.31	.32	.34	.35
5 lbs. or more in 5-lb. containers	.38	.38	.41	.42

(c) Export Sales and Sales to Persons in Territories and Possessions of the United States.

The following maximum prices are established for export sales of citric acid and for sales to persons in the territories or possessions of the United States, where the shipments originate in the Continental United States. exclusive of Alaska:

(1) Exports and Sales by Producers and Primary Jobbers.

(i) The maximum prices, except for export sales to persons in Canada or Mexico, are the maximum prices listed in subparagraph (1) (i) of paragraph (a) of this Appendix, f. a. s. vessel at the port of shipment plus 10 per cent of the applicable maximum price.

(ii) The maximum prices for export sales to persons in Canada or Mexico are the maximum prices listed in subparagraph (1) (i) of paragraph (a) of this Appendix, plus 5 per cent of the applicable maximum price, f. o. b. shipping point in case of overland shipments, or f. a. s. vessel at the port of shipment in case of shipment by vessel.

(2) Exports and Sales by Resellers.

(i) The maximum prices, except for export sales to persons in Canada or Mexico, are the maximum prices listed in subparagraph (1) (i) of paragraph (a) of this Appendix, f. a. s. vessel at the port of shipment, plus 40 per cent of the applicable maximum price.

(ii) The maximum prices for export sales to persons in Canada or Mexico are the maximum prices listed in paragraph (b) of this Appendix, plus 5 per cent of the applicable maximum price, f. o. b. shipping point in case of overland shipments, or f. a. s. vessel at the port of shipment in case of shipments by vessel.

(3) Expenses.

No expenses, commissions, or charges for services may be added to the maximum prices established in ths paragraph (c), except (a) ocean or overland freight, (b) marine and war risk insurance, and (c) foreign agents' commission, unless such foreign agents' commission or any part thereof is received by the exporter directly or indirectly for his own use.

(d) Containers.

No charge for containers may be added to the maximum prices established above.

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storage space. Arrangements being made for continuous deliveries from distilleries.

Fats and Oils

Jan. 13, 1942. Hide, skins, asbestos from South Africa, rapeseed oil, cocoanut oil, copra, palm oil and tung oil added to materials listed in General Imports Order M-63.

All imports, with certain exceptions, must be made by Government agencies and supplies afloat sold to these agencies.

Jan. 26, 1942. WPB relaxed General Preference Order M-71 by eliminating the three months inventory restriction and substituting a restriction on processing.

Feb. 4, 1942. Amendment No. 2 to Price Schedule No. 53, effective Feb. 4, 1942, revises prices.

Feb. 25, 1942. Price Schedule No. 25, issued Aug. 28, 1941, has been revoked.

Formaldehyde

Jan. 15, 1942. Price Schedule 21 amended. Withdraws exemptions for formaldehyde to be used in embalming fluids from maximum prices provided in the schedule. Puts all users on same basis regardless of uses to which it is put.

Graphite

Feb. 17, 1942. Order M-61 limits use of Madagascar flake graphite to the manufacture of crucibles for the war effort.

Lead

Jan. 8, 1942. Order M-72 establishes full priority control. Priorities Regulation No. 1 made applicable. Dealers and consumers required to make monthly reports.

Jan. 10, 1942. Conservation Order M-38-c puts sweeping restrictions on use of lead. Certain uses are banned and other essential uses curtailed. Amendment to General Imports Order M-63 adds lead to list of materials that cannot be imported except by Metal Reserve Co.

Jan. 13, 1942. OPA asks lead pigment products makers not to exceed prices in effect Jan. 2, 1942.

Jan. 13, 1942. Lead, lead scrap and secondary lead prices adjusted to spur domestic production.

Jan. 20, 1942. Producers of metallic lead products asked not to exceed prices arrived at by adding 65-100ths of a cent per lb. of lead content for each product.

Jan. 28, 1942. Producers of metallic lead products given temporary choice on maximum prices must either hold to prices not higher than those of Jan. 2, 1942 or to not higher than their maximum price on April 1, 1941 plus 65-100ths of a cent per lb. of lead content.

Lithopone

Jan. 29, 1942. OPA issued Price Schedule No. 80, effective Feb. 2 setting maximum price of \$.0425 per lb. for normal grade of lithopone.

Mercury

Jan. 26, 1942. Conservation Order M-78 curtails use of mercury in number of civilian manufacturing processes.

Feb. 4, 1942. Price Schedule No. 93, effective Feb. 4, sets maximum prices. Prime virgin mercury produced in California, Oregon, Washington, Idaho, Utah, Nevada, and Arizona at \$191 per 76-lb. flask, f.o.b. shipping point.

Nickel

Jan. 21, 1942. Conservation Order M-6-b issued by Director of Priorities to plug loopholes in priority control of nickel by which some secondary metal and nickel already in fabricators' inventories had been escaping into less essential uses.

Nicotine Sulfate

Feb. 13, 1942. Producers, distributors and dealers requested not to sell 40% nicotine sulfate for agricultural uses in 50 lb. drums at prices higher than 80 cents per lb. delivered to distributors, nor in 10 lb. containers at prices higher than 90 cents lb. so delivered.

Oxalic Acid

Jan. 29, 1942. OPA established Price Schedule No. 78, effective Feb. 2. Oxalic acid in 100-lb. lots or more set at 11¼ cents per lb., f.o.b. producer's shipping point (with freight equalization provisions).

Polyvinyl Chloride

Jan. 5, 1942. Amendment No. 1 to Preference Rating Order M-10 extends order indefinitely.

Rubber

Feb. 19, 1942. Limited supplies of scrap rubber made available for use in less essential civilian articles.

Amendment No. 4 to M-15-b, effective Feb. 19, 1942, removes unvulcanized scrap rubber compounds from definition of rubber.

Sodium Nitrate

Jan. 15, 1942. General Preference Order M-62, effective Feb. 1 establishes complete allocations system.

Sulfite Pulp

Jan. 10, 1942. General Preference Order M-52 establishes allocations system.

Synthetic Resins

Feb. 4, 1942. Price Schedule No. 95, effective immediately, established for nylon stockings.

Tin

Jan. 13, 1942. Amendment to Order M-43 cuts deliveries to small users.

Jan. 28, 1942. WPB orders 50% curtailment in tin can production.

Feb. 3, 1942. Order M-21-e reduces thickness allowed in cans one tenth of a lb. per base box. Quota system established.

Feb. 7, 1942. Can manufacturers ordered to fill Army and Navy orders ahead of all others.

Feb. 12, 1942. A-1-a rating given to speed completion of tin smelter in Texas.

Conservation Order M-81 drastically cuts manufacture, sale, and delivery.

Feb. 20, 1942. Certain restrictions on tinplate and terneplate suspended until April 30, 1942.

Titanium Dioxide

Jan. 28, 1942. Amendment No. 3 to General Preference Order M-44 increased percentage of titanium dioxide which must be set aside by producers for direct allocation from 20 to 25%.

Titanium Pigments

Jan. 7, 1942. Amendment No. 2 to General Preference Order M-44 clarifies production and distribution regulations.

Tung Oil

Jan. 8, 1942. General Preference Order M-57 places tung oil under full priority control. All existing supplies and future imports to be purchased by Defense Supplies Corp. Deliveries banned except for A-2 order and certain specified uses.

Feb. 17, 1942. General Preference Order M-57 extended to April 15, 1942.

Tungsten

Feb. 14, 1942. Conservation Order M-29-b further conserves tungsten curtailing use immediately and eventually banning certain uses after May 1, 1942.

Vitamin A

Feb. 9, 1942. Limitation Order L-40.

Zinc

Jan. 30, 1942. Price Schedule No. 81, effective Jan. 29, 1942 establishes ceiling for primary slab zinc.

Feb. 2, 1942. Zinc pool for February increased 9% over January setting February figure at 40%, based on November, 1941, production. Zinc oxide pool doubled, from 10 to 20%. No zinc dust set aside for February.

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A Complete Check-List of Products, Chemicals, Process Industries

Petroleum*

Improved process of neutralizing an acid treated oil of the lubricating type, derived from a petroleum distillate of high neutralization number, which comprises substantially neutralizing the mineral acidity of said oil without neutralizing the organic acidity thereof by means of caustic soda solution, treating the partially neutralized oil with a rosin soap solution to settle out mineral salts and soaps therefrom, and neutralizing the organic acidity of said oil with caustic soda solution. No. 2,269,647. Arthur Catanach and Eric Kolthoff to Gulf Oil Corp.

Solid lubricating composition comprising in combination petroleum jelly and candelilla wax as the major wax constituent. No. 2,269,-720. Harry Johnson to The Lubri-Zol Corp.

Method of prospecting for petroleum deposits. No. 2,269,889. Ludwig Blau to Standard Oil Development Co. a corporation of Delaware.

Method of sealing porous water-containing formations adjacent oil and gas wells, which comprises injecting into the formations a compound of a polyvalent metal the oxides and hydroxides of which are substantially insoluble in water, said metal carrying at least one OR group the oxygen atom of which is directly attached to the metal atom and wherein R is selected from the class consisting of alkyl and aryl groups; whereby an insoluble sealing mass is produced in the porous formations by reaction of water with said compound. No. 2,270,006. Harvey Kennedy to Gulf Research & Development Co.

Catalytic treatment in stainless steel apparatus. No. 2,270,026. Robert P. Russell to Standard Oil Development Corp.

Hydrocarbon conversion process. No. 2,270,027. Joseph G. Alther to Universal Oil Products Co.

Catalyst for conversion of hydrocarbon oil comprising the product formed by first treating a base-exchange zeolite of the alumina-silica class with ammonium phosphate and thereafter heating the resulting product to liberate ammonia. No. 2,270,044. Stewart C. Fulton & Boris Malishev to Standard Oil Development Co.

Method producing polymers of isobutylene not higher in molecular weight than tetraisobutylene which comprises contacting diisobutylene with anhydrous ferric chloride at a temperature of about 150° to 300° F. No. 2,270,052. Erwin M. Hattox to Standard Oil Development Co.

Process for treatment of mineral oils containing objectionable sulfur compounds comprising treating said oils with an alkali metal aluminum silicate of the zeolite type at a pressure above about 600° F. said temperature and pressure being in the range at which substantially no cracking or decomposition of the oil occurs. No. 2,270,058. Minor C. K. Jones to Standard Oil Development Co.

Method for manufacturing pour point depressants for waxy lubricating oils. No. 2,270,062. Eugene Lieber to Standard Oil Development Co.

Process for the conversion of hydrocarbon oils to produce gasoline containing a relatively small amount of olefinic hydrocarbons. No. 2,270,071. Edwin H. McGrew to Universal Oil Products Co.

Process of converting hydrocarbons. No. 2,270,072. Edwin H. McGrew to Universal Oil Products Co.

Hydrocarbon oil conversion process. No. 2,270,086. Jean D. Seguy to Universal Oil Products Co.

Process for manufacture of catalytic material suitable for accelerating hydrocarbon conversion reactions. No. 2,270,090. Charles L. Thomas to Universal Oil Products Co.

Process for producing substantially saturated gasoline of high antiknock value. No. 2,270,091. Charles L. Thomas to Universal Oil Products Co.

Method making a mixture of lead tetra-alkyl compounds containing lead mixed-alkyl compounds which comprises producing by means of a catalyst an interchange of alkyl radicals between lead tetra-alkyl molecules there being at least two different alkyl radicals present. No. 2,270,108. George Calingaert and Harold A. Beatty to Ethyl Gasoline Corp.

The process making a mixture of methyl and ethyl lead tetraalkyl compounds including the methyl-ethyl lead compounds which comprises reacting ethyl chloride and a methyl halide with a sodium lead alloy having a sodium content between 7 and 18 per cent. by weight in the presence of a catalyst. No. 2,270,109. George Calingaert and Harold A. Beatty to Ethyl Gasoline Corp.

Liquid compounded hydrocarbon oil containing a metal salt of an organic acid in an amount sufficient substantially to increase the corrosivity of said oil and a corrosion inhibitor comprising an ester containing an amino substituent. No. 2,270,113. James O. Clayton and Bruce B. Farrington to Standard Oil Co. of Calif.

A solid catalyst material which consists of at least one metal of the first transition series of the periodic table having an atomic number less than 26 and an activated alumina processing the physical structure and surface characteristics of the "activated alumina" of commerce, the transition series metal being present in substantial but lesser amount than the activated alumina and incorporated in the surface of the activated alumina. No. 2,270,165. Herbert P. A. Groll, James Burgin to Shell Development Co.

Lubricant comprising a lubricating oil, a metal salt of a carboxylic acid in an amount in excess of that which would be soluble in said lubricating oil and a phosphatidic material in an amount sufficient to render said first mentioned amount of said salt soluble in said oil. No. 2,270,241. Elmer Adams, Lawrence Brunstrum and Alfred Weitkamp to Standard Oil Co., Chicago, Ill., a corp. of Indiana.

Process for sweetening sour hydrocarbon distillates which comprises **treating the distillate with an aqueous hydrogen** halide solution, separating the distillate from the solution and then treating the same with a sweetening agent containing combined copper and a combined halogen. No. 2,270,248. Wayne Benedict and Charles Dryer to Universal Oil Products Co.

Process for producing a catalytic compound which comprises reacting a hydrocarbon halide with metallic aluminum thereby forming a di-hydrocarbon aluminum-mono-halide, and reacting the last-named compound with a sufficient quantity of an aluminum tri-halide to convert it into a mono-organo-aluminum-di-halide, the halogen of said halides being selected from the group consisting of chlorine, bromine and iodine. No. 2,270,292. Aristid Grosse to Universal Oil Products Co.

In method of geochemical prospecting in which samples of soil gas obtained from spaced points in an area to be explored and analyzed for their content of hydrocarbons and derivatives thereof which constitute indications of leakage from subterranean petroliferous deposits, the step of securing the gas samples by treating the soil with an acid capable of disintegrating the carbonates therein, whereby entrained constituents are evolved in gaseous form. No. 2,270,299. Leo Horvitz to Esme E. Rosaire.

In polymerization of an olefinic mixture containing isobutene and propene in the presence of solid phosphoric acid catalyst, the method of producing high yields of isoheptenes which comprises subjecting the olefinic mixture to the action of the solid phosphoric acid catalyst at a temperature of the order of 200 to 325° F. and under a pressure of about 500 to 600 lbs. per square inch whereby to effect mixed polymerization of isobutene and propane as the primary reaction in the process. No. 2,270,302. Vladimir Ipatieff and Raymond Schaad to Universal Oil Products Co.

Continuous process for the hydrogenation of octenes which comprises subjecting the vapors of said octenes in admixture with a molal excess of free hydrogen of less than 60% to contact with catalytic material comprising approximately 62% nickel, 4% oxygen combined in nickel oxide, 6% graphite, and 28% kieselguhr at temperatures within the range of 170-215° C. under pressure of from atmospheric to 200 lbs. per square inch and times of contact corresponding to liquid space velocities of approximately four per hour. No. 2,270,-303. Vladimir Ipatieff to Universal Oil Products Co.

Lubricant consisting essentially of a waxy lubricating oil and not more than 5% of tall oil. No. 2,270,319. Eugene Lieber to Standard Oil Development Co., a corp. of Delaware.

Sweetening process which comprises treating sour hydrocarbon distillate with plumbite solution to convert mercaptans to lead mercaptides, separating unconsumed plumbite solution from the resultant mercaptide-containing distillate, combining with the latter additional sour distillate, adding sulfur to the mixture to convert the lead mercaptides to lead sulfide, and then washing the mixed distillates with water to separate the lead sulfide. No. 2,270,322. Charles Lowry, Jr. to Universal Oil Products Co.

Catalytic hydrocarbon conversion. No. 2,270,360. Vanderveer Voorhees to Standard Oil Co., Chicago, Ill., a corp. of Indiana.

Process for desalting oil which comprises agitating a petroleum oil containing particles of salt with a saline solution to partly dissolve the salt passing the mixture through a body of contact material to substantially completely dissolve said solid salt in the saline solution and then immediately separating the solution and oil. No. 2,270,411. Sumner E. Campbell.

Process of dehydrating oils. No. 2,270,412. Sumner E. Campbell.

Gel-Type metal oxide catalyst. No. 2,270,503. Robert E. Burke and Everett C. Hughes to The Standard Oil Co.:

Catalyst and process of making. No. 2,270,504. Robert E. Burke and Everett C. Hughes to The Standard Oil Co.

Lubricating oil suitable for internal combustion engines containing dissolved from .25% to 5.0% of a sulfonate salt and an arylamine having anti-oxidant properties in an amount between .25% to 2% and not less than 1/6 of the content of said salt said sulfonate being oil-soluble free of free acid and combining a petroleum sulfonic acid with a polyvalent metal which forms an oxide that is not readily converted to other oxides under conditions of crankcase lubrication. No. 2,270,577. Roland F. Bergstrom and Earl E. Phillips to Shell Development Co.

Method producing lubricants comprising oxidizing a highly refined ant mixture to react with the saponifiable materials filtering and paraffinic type lubricating oil to produce in the oil reaction products including petroleum acids ading a calcium compound to the resultadding the resultant soap-oil solution to a naphthenic type lubricating oil to yield between about 0.8% and 3% of total soap in the resultant lubricating oil composition. No. 2,270,620. Ulric B. Bray to Union Oil Co. of California.

Extraction process wherein mercaptans of different degrees of ease of transference contained in a hydrocarbon oil are extracted with an aqueous solution of alkali meal hydroxide and solutizer which is substantially immiscible with and chemically inert to said hydrocarbon oils. No. 2,270,667. Albert V. Caselli and Alan C. Nixon to Shell Development Co.

Process for production of isobutane from lower molecular weight saturated hydrocarbons which comprises continuously passing propane vapors along with a hydrogen halide over a supported acid-acting metal halide catalyst maintained at a temperature above about 100° C. but not substantially in excess of 200° C. and removing isobutane from the reaction mixture by reaction witht an olefine. No. 2,270,669. Martin de Simo and Frank McMillan to Shell Development Co.

Method of separating high molecular mixtures. No. 2,270,674. Stanislaw Pilat and Marian Godlewicz to Shell Development Co.

Process for converting paraffin hydrocarbons of two or more carbon atoms per molecule to gasoline boiling hydrocarbons of controlled volatility. No. 2,270,700. Frederick E. Frey to Phillips Petroleum Co.

Catalytic treatment of petroleum distillates. No. 2,270,715. Edwin T. Layng and Louis C. Rubin to M. W. Kellogg Co.

Process of converting heavy hydrocarbon oils into gasoline comprising vaporizing said oils and subjecting the vapors thereof at a temperature between about 700 and 1050° F. to the action of a solid porous contact catalyst consisting essentially of silica gel the surface of which is coated with a layer of thoria cooling the vapors and recovering gasoline from the products. No. 2,270,812. Ralph M. Melaven and Rodney V. Shankland to Standard Oil Co.

Process for the solvent extraction of liquid mixtures. No. 2,270,827. Sijbren Tijmstra to Shell Development Co.

Process separating suspended impurities from a spent emulsion-type petroleum naphtha cleaning fluid consisting of petroleum naphtha and an alkaline solution distributed one within the other by an emulsifying agent such as soap which comprises passing isopropanol vapor into the heated impure petroleum naphtha cleaning fluid causing separation of a supernatant layer of petroleum naphtha and subjacent layers of solution impurities and isopropanol. No. 2,270,-837. Colin C. Jones to Chemical Reclaiming Sales Co., Inc.

* Cont'd. from Off. Gaz.—Vol. 534, Nos. 1, 2, 3, 4.

U. S. Chemical Patents

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Catalytic conversion of hydrocarbons. No. 2,270,887. Glen H. Morey and Frederick E. Frey to Phillips Petroleum Co.

Process for increasing the hydrocarbon content of hydrocarbon products which consists in preparing an aqueous colloidal mixture of a hydrocarbon base material, simultaneously injecting said mixture and a hydrogen carrier at a pressure range between 12,000 and 14,000 pounds per square inch, into a chamber within which a temperature of approximately 1,000° F. is maintained and causing the said base material and hydrogen carrier to be brought into direct impingement at a common focal point in the said heated chamber, circulating the mixture formed in said chamber at a predetermined speed by and in contact with a catalyst, and subsequently cooling and condensing the gaseous products resulting from the catalytic reaction. No. 2,271,017. Rene Leprestre, Margaret C. Leprestre, H. Douglas Hadden, Ralph C. Tobin and Joseph Dannenberg executors of estate of said Leprestre, deceased, to Applied Chemicals, Inc.

In process for isomerization of a saturated aliphatic hydrocarbon containing more than 3 and less than 6 carbon atoms with an aluminum halide catalyst, the step of executing the isomerization reaction under between 0.08 and 33 atmospheres pressure of said hydrogen being sufficient to substantially repress undesirable side reactions, but insufficient to substantially repress the isomerization reaction. No. 2,271,043. Adrianus J. van Peski to Shell Development Co.

Process for converting higher boiling hydrocarbon oil into lower boiling hydrocarbons. No. 2,271,095. Joseph K. Roberts to Standard Oil Co.

Process for converting lower boiling hydrocarbons into lower boiling hydrocarbons. No. 2,271,096. Robert F. Ruthruff and Charles F. Feuchter to Standard Oil Company, (a corp. of Ind.)

Process for converting higher boiling hydrocarbons into lower boiling hydrocarbons. No. 2,271,097. Robert F. Ruthruff and Joseph K. Roberts to Standard Oil Co.

Method of controlling concentration of dispersed solid material in a vertical, upflow fluid-solid contacting system which comprises automatically varying the pressure in the contacting zone in response to variations in pressure differential between the top and bottom of said contacting zone. No. 2,271,148. Sam B. Becker and Everett A. Johnson to Standard Oil Co. (a corp. of Ind.)

Process for increasing the concentration of free hydrogen in a gas comprising substantial quantities of free hydrogen and hydrocarbons of one to three carbon atoms which comprises expositing said gas to the action of water under superatmospheric pressure and at a low temperature above the freezing point of water under conditions such that solid hydrates of the hydrocarbons may form and then separating the remaining gas from the solid hydrates. No. 2,271,-214. Albert B. Welty, Jr. to Standard Oil Development Co.

In process of catalytic conversion of gaseous mixtures containing carbon monoxide and hydrogen into hydrocarbons with catalysts adapted to form benzine oil and paraffin under atmospheric pressure said catalysts being arranged in a contact chamber adapted to maintain a desired reaction temperature therein, the steps comprising maintaining a temperature in said contact chamber above 150° C. but below the temperature required for the exclusive formation of methane with said catalysts maintaining a velocity of the gas flow in contact with said catalysts above one normal litre per hour per gram of hydrogenating metal in said catalysts and adjusting the pressure of the gas to a pressure above atmospheric and sufficient that the time the gases remain in contact with said catalysts is more than 45 seconds. No. 2,271,259. Wilhelm Herbert to American Lurgi Corp.

Conversion of hydrocarbon oils. No. 2,271,298. Lyman C. Huff to Universal Oil Products Co.

Manufacture of catalysts. No. 2,271,299. Fladimir Ipatieff and Herman Pines to Universal Oil Products Co.

Process for converting hydrocarbon distillate heavier than gasoline into substantial yields of gasoline. No. 2,271,317. Charles L. Thomas and Jacob E. Ahlberg to Universal Oil Products Co.

Process converting hydrocarbon distillates heavier than gasoline into substantial yields of gasoline. No. 2,271,318. Charles L. Thomas and Jacob E. Ahlberg to Universal Oil Products Co.

Process converting hydrocarbon distillates heavier than gasoline into substantial yields of gasoline. No. 2,271,319. Charles L. Thomas and Jacob E. Ahlberg to Universal Oil Products Co.

Plastics, Resins*

Process making linear polymers which comprises heating to reaction temperature a polyamide-forming composition comprising essentially reacting material in which each molecule has two and only two reactive groups, said groups being amide-forming groups each of which is complementary to one of the amide-forming groups in other molecules, said groups being selected from the class consisting of carboxylic, isocyanate, and isothiocyanate groups. No. 2,268,-586. Lucius Gilman to E. I. du Pont de Nemours & Co.

Polyvinyl acetal resin. No. 2,269,166. Martti Salo to Eastman Kodak Co.

Method of preparing an oil-soluble resinous composition by refluxing para-hydroxy amyl benzoate and formalin containing 37.1% formaldehyde in a ratio of the order of, by weight 21.5 parts of the former to 9.1 parts of the latter in the presence of small amount of oxalic acid and dehydrating the resulting mass. No. 2,269,186. Gaetano F. D'Alelio to General Electric Co.

Polyvinyl acetal resin in which the acetal linkages are formed in part from benzaldehyde acetal groups and in part from aliphatic aldehyde acetal groups said resin having a hydroxyl group content equivalent to not more than about 15% by weight of polyvinyl alcohol and an acetate group content equivalent to not more than about 10% by weight of polyvinyl acetate. No. 2,269,216. James G. McNally and Russel H. Van Dyke to Eastman Kodak Co.

Polyvinyl acetal resin in which the acetal linkages are formed from a plurality of different aliphatic aldehyde acetal groups having not more than four carbon atoms said resin having a hydroxyl group content equivalent to not more than about 15% by weight of polyvinyl alcohol and an ester group content equivalent to not more than about 10% by weight of polyvinyl ester. No. 2,269,217. James G. McNally and Russel H. Van Dyke to Eastman Kodak Co.

Composition of matter comprising a moldable material having a resin base and a filler consisting of carbon black having an oil absorptive index of the order of 65. No. 2,269,267. James H. Hunter to Radio Corp. of America.

* Cont'd. from Off. Gaz.—Vol. 534, Nos. 1, 2, 3, 4.

Method of molding casein products which comprises intermixing casein in substantially dry status with ammonium acetate in substantially dry status in the proportion ranging from five per cent. (5%) to fifty per cent. (50%) by weight of ammonium acetate, subjecting such intermixture to elevated temperature to effect interaction of the ingredients, permitting the escape of ammonia and other gases, and molding the resulting heated plastic mass while permitting escape of ammonia and other gases. No. 2,269,464. Christopher Luckhaupt.

Process compounding a plastic material consisting of pulverizing oats, mixing the pulverized oats in water in the proportion of one pound of oats to twenty pounds of water, heating the mixture of oats and water to 212° F. until the mixture assumes a jelly-like consistency, adding approximately one-sixteenth ounce sassafras oil as a mold retardent, and adding not more than four pounds of fibrous material to bring the product to the desired consistency for application. No. 2,269,509. Michael Batelja.

Article of manufacture formed from colored plastic material having a curved surface, a portion of said surface being formed with closely spaced groups of curved lines arranged to produce a visible color spectrum effect which varies at different angles of vision and is influenced by the superimposed color of the plastic base. No. 2,269,521. William Darrah.

A resinous co-polymer of styrene with a nu-clear alkylated styrene, which co-polymer contains, in chemically combined form, an appreciable proportion of each of said compounds. No. 2,269,810. Robert Dreisbach and Sylvia Stoesser to The Dow Chemical Co.

Method of die casting thermoplastics. No. 2,269,953. Louis Morin and Davis Marinsky.

Composition comprising polyvinyl halide and a methyl chlor stearate having at least 3 chlorine atoms in the molecule. No. 2,269,990. Moyer Safford to General Electric Co.

N-sulphonylalkylenimine polymers. No. 2,269,997. Gerard Berchet to E. I. du Pont de Nemours & Co.

Aqueous dispersion of the resin obtained by the interpolymerization of from 40% to 95% 2-ethyl hexyl methacrylate and from 60% to 5% methyl methacrylate. No. 2,270,024. Archibald Renfrew and W. E. Frew to Imperial Chemical Industries, Ltd.

Vinyl aromatic resins, method of purifying. No. 2,270,184. Robert R. Dreisbach to The Dow Chemical Co.

Sheet of polyvinyl alcohol having birefringence greater than .03 and having its molecules oriented to substantial parallelism. No. 2,270,-323. Edwin Land and Cutler West to Polaroid Corp.

In process preparing artificial resinous products from poly-carboxylic acids and polyhydric alcohols which involves melting about 136 parts of pentaerythritol and about 290 parts of adipic acid to form a reaction mixture holding said reaction mixture at about 140° C. for about 0.5 hour until the evolution of water vapor is practically finished, whereby a first stage condensation product is obtained, the improvement which comprises heating said first stage condensation product at about 1300° C. in a vacuum for abuot 1½ hours to obtain a tempered heat treated condensation product, and then subjecting said tempered heat treated condensation product to a temperature of about 120° C. for about 0.5 hour at atmospheric pressure to obtain a hardened ripened condensation product. No. 2,270,889. Kurt Nagel and Franz Koenig to Chemical Marketing Co., Inc.

Plastic materials, apparatus and method for molding. No. 2,271,063. Peter De Mattia.

Process for improving articles cut or stamped from sheets of organic film-forming plastic masses which comprises rolling said articles into a roll, the edges of which comprise the cut edges of said articles, subjecting said roll to a vacuum and applying a swelling agent or solvent thereto sufficient to cause swelling of the cut edges only. No. 2,271,192. Gerhard Hinz to Sherka Chemical Co.

Composition comprising polyvinyl alcohol and beta-hydroxy-ethyl ammonium chloride. No. 2,271,468. William W. Watkins to E. I. du Pont de Nemours & Co.

Rubber*

Gassing rubber by a combination of external and internal gases. No. 2,268,621. Dudley Roberts and Lester Cooper to Rubatex Products, Inc.

Composition of unvulcanized crepe rubber. No. 2,269,377. Morris Omansky to Monsanto Chemical Co.

Rubber having incorporated therein a small proportion of a combination of primary and secondary accelerators in which the primary accelerator is a member of the group consisting of 2-mercapto-thiazoline and carbon substituted 2-mercapto-thiazolines in which the substituents are selected from alkyl and hydroxyalkyl groups, and the secondary accelerator is a member of the group consisting of aldehyde-amines and aryl guanidines, there being from about 1 to about 50 parts of the primary accelerator to each part of the secondary accelerator in the combination. No. 2,269,472. Arthur Neal and Bernard Sturgis to E. I. du Pont de Nemours & Co.

Method preventing adhesion of tacky unvulcanized rubber at ordinary temperature which comprises applying to the surface of the rubber a solution of a resin of the class consisting of coumarone and indene polymers and mixtures thereof, and evaporating the solvent to deposit on the rubber a continuous film consisting solely of the said resin. No. 2,269,660. George Griffin to The B. F. Goodrich Co

Method obtaining highly purified cyclorubber which comprises subjecting rubber to heat in a bath of a phenol in the presence of a cyclizing agent for a time and temperature such that a composition is obtained comprising phenol and a cyclorubber, admixing said composition of cyclorubber and phenol with a solvent for the phenol which is substantially a non-solvent for the cyclorubber, kneading the mixture so obtained at a temperature such that said cyclorubber is a plastic coherent mass whereby entrapped phenol is released and dissolves in the solvent, and removing the phenol-containing solvent from the mixture. No. 2,270,930. Hugh J. Cameron to Marbon Corp.

Process of stabilizing synthetic rubber-like materials. No. 2,270,959. Hans Murke and Wilhelm Becker to I. G. Farbenindustrie Aktiengesellschaft.

Process of vulcanizing rubber which comprises heating rubber and sulfur in the presence of an amino methylene imide of an organic dicarboxylic acid containing at least four carbon atoms, the said amino substituent being the residue remaining after the removal of one hydrogen atom from a member of a group consisting of guanidines, ammonia and mono and disubstituted ammonias wherein the substituents are selected from a group consisting of alkyl, aryl, aralkyl and alicyclic radicals. No. 2,271,122. Marion W. Harman to Monsanto Chem. Co.

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Method vulcanizing a rubber in the presence of N, N'-polythioamine and an accelerator. No. 2,271,123. Paul C. Jones to The B. F. Goodrich Co.

Rubber impregnated and coated web. No. 2,271,458. Ernest Lionne.

Method for making closed-cell cellular hard rubber and product of the method. No. 2,271,498. Robert L. Overstreet to Salta Corp.

Textiles*

In process of laminating a plurality of fabric piles by means of an intermediate film of an interpolyamide the improvement which comprises introducing 4 to 15% water into the interpolyamide film and thereafter applying heat and pressure said interpolyamide being one which yields upon hydrolysis with hydrochloric acid a diamine hydrochloride and a dibasic carboxylic acid. No. 2,269,125. Charles C. Quenelle and Cornelius F. Turner to E. I. du Pont de Nemours & Co.

A sulfuric acid fulled felt comprising a mixture of animal fibers and cold drawn fibers of a synthetic linear polyamide said felt impregnated with synthetic latex. No. 2,270,223. Paul Schlack to E. I. du Pont de Nemours & Co.

Process of rendering textile materials water repellent. No. 2,270,658. Wolfgang Linnhoff to North American Rayon Corp.

Method of dyeing yarns and other shapes comprising vinyl polymers comprising the step of treating the yarn or shape with a dye bath containing a suspension dyestuff in the presence of 8-hydroxyquinoline. No. 2,270,706. Karl Heymann to American Viscose Corp.

Process for improving the wash-fastness of water-dispersible, hydroxyl-containing size on textile material which comprises treating the textile material with said size and with a chloral addition product having an organic group containing at least two carbon atoms, and subsequently heating said treated materials to effect reaction between the size and the chloral addition product. No. 2,270,841. Louis H. Bock and Alva L. Houk to Rohm & Haas Co.

Process of imparting hydrophobic properties to fibrous materials. No. 2,270,893. Ludwig Orthner and Cerhard Balle and Georg Dittus to I. G. Farbenindustrie Aktiengesellschaft.

Process for producing a smoothly-lying and closely woven elastic fabric from stretched and unvulcanized rubber thread containing a soluble extensibility-reducing agent to prevent retraction of the thread, which comprises treating said fabric with a solvent for said agent in the presence of heat to remove the agent and vulcanize the thread, while limiting retraction of said fabric. No. 2,271,101. Thomas Shepherd to The Clark Thread Co.

Method of preparing a fabric in a relatively extensible form which comprises the steps of forming a thread from an aqueous dispersion of rubber containing a quantity of removable lyophilic colloid sufficient to reduce the extensibility of the thread, coagulating the thread applying a coating of removable hydrophilic colloid to the thread, hardening the coating, forming a fabric from the thread and subsequently and simultaneously removing the coating and the lyophilic colloid and dyeing the thread by treating the same with a mixture containing a dye and a solvent for the lyophilic colloid and the coating. No. 2,271,102. Thomas L. Shepherd to The Clark Thread Co.

Process for production of an identification marker, which comprises treating a fabric containing organic derivatives of cellulose yarns having a denier of at least 300 with a solution of a plasticizer in a volatile solvent therefor and drying the fabric at a temperature of substantially 70 to 80° C. in the absence of pressure. No. 2,271,198. Arthur Lyem to Celanese Corp. of America.

Method producing spinnable textile fibers from corn straw which method comprises the steps of boiling the straw with 105% soda solution, washing and squeezing the material to remove the leafy parts, then boiling for a short time with a 1-3% urea solution leaving the material in said urea solution for about 3 to 4 hours adding to the urea solution a solution of 1-3% hours thereby evolving free ammonia and washing drying and disintegrating so as to form fibers. No. 2,271,218. Friedrich Baudisch.

Following patents are from Vol. 535, No. 1

Cellulose

Coated cellulosic sheet material. No. 2,271,724. Waldorf S. Traylor to Hercules Powder Co.

Ceramics, Refractories

Process for making porous material. No. 2,271,845. Joseph Parsons to United States Gypsum Co.

Heat conducting refractory comprising ferrosilicon 70 to 20% by weight chromic oxide 50 to 10% by weight, and silicon carbide 70 to 15% by weight bonded by 5 to 60% by weight of fused sillimanite. No. 2,272,038. John D. Morgan to Cities Service Oil Co.

Composition comprising sillimanite silicon and a fused refractory from the group consisting of alumina, zirconia and chromium oxide, said materials being bonded together by the reaction products resulting from the action thereon of 1%-10% by weight of phosphoric acid and .5%-5% by weight of chromic acid. No. 2,272,039. John D. Morgan to Cities Service Oil Co.

Chemical Specialty

Method making adhesive composition having alkaline pH of 10 or less from a vegetable protein freed from substantial proportion of non-proteinogenous matter normally associated therewith. No. 2,271,620. John C. Brier and Gerard W. Mulder to Welsh & Green, Inc.

Dry cleaning composition and method. No. 2,271,635. Lawrence H. Flett to Allied Chemical & Dye Corp.

Non-caustic germicide mixture for solution in H_2O comprising $FeCl_2$ and $FeCl_3$ in the ratio of one gram molecular weight of $FeCl_2$ to each two grams molecular weight of $FeCl_3$. No. 2,271,638. Howard L. Guest to L. A. Gunther.

Meringue composition containing small amount of added lactic acid. No. 2,271,654. Verne D. Littlefield to Armour & Co.

* Cont'd. from Off. Gaz.—Vol. 534, Nos. 1, 2, 3, 4.

Bread containing rope and mold inhibiting quantities of a non-toxic, soluble acetate salt containing combined but indissociated acetic acid. No. 2,271,756. Hans F. Bauer and Elmer F. Glabe to Stein, Hall Mfg. Co.

Insect repellent containing as its essential active ingredient di-morpholine thiuran disulfide. No. 2,272,044. Roscoe H. Carter to Henry A. Wallace.

Insecticide containing as its essential active ingredient 1, 4-diphenyl semicarbazide. No. 2,272,047. Andrew F. Freeman to Henry A. Wallace.

Lacquer emulsion. No. 2,272,152. Malcolm C. Moore to Hercules Powder Co.

Coal Tar Chemicals

2-keto-1, 2, 3, 4-tetrahydronaphthalenes which in the 1-position are linked to a carbon atom of an organic radical selected from the group consisting of the alkyl-, aminoalkyl- and aliphatically bound phenyl-radicals. No. 2,271,674. Hans Andersag and Walter Salzer to Winthrop Chemical Co., Inc.

Process producing high-molecular oxygen-containing compounds which comprises causing alkali metals to act at a temperature between 30° and 250°C. on a mixture of ketones formed by ketonizing a mixture of higher molecular fatty acids obtained by the oxidation of high-molecular aliphatic hydrocarbons and decomposing the alkali metal compounds obtained with water. No. 2,271,708. Max Neber to Teneral Aniline & Film Co.

Chrysene derivatives and process of making same. No. 2,272,011. Walter Kern and Richard Tobler to Society of Chemical Industry in Basle.

Nuclear ketones of cyclopentanopolyhydrophenanthrene series and process of making same. No. 2,272,131. Leopold Ruzicka to Ciba Pharmaceutical Products, Inc.

Process purifying 3-picoline that is contaminated by the co-presence of at least one of the bases 4-picoline and 2, 6-lutidine, which consists in heating the contaminated 3-picoline with sulfur, and separating the unreacted 3-picoline from reaction products. No. 2,272,159. Francis E. Cislak and William R. Wheeler, to Reilly Tar & Chemical Corp.

Coatings

Coating composition possessing decreased gelling tendencies, comprising a tough and strong artificial resin resulting from the conjoint polymerization of a vinyl halide with a vinyl ester of a lower aliphatic acid, said resin being dissolved in sufficient quantity of a volatile solvent to decrease the gelling tendency of resulting composition, comprising a nitroparaffin and a liquid coal tar hydrocarbon to make a readily flowable composition adapted to produce resistant adhesive and stable protective or ornamental surface coatings. No. 2,271,581. Charles Bogin to Commercial Solvents Corp.

In process enamel-coating ferrous metals the new step of applying to sheet a bond-coat containing acid solution of antimony trichloride and arsenic trichloride, and stannous chloride. No. 2,271,706. William C. Morris to Poor & Co.

Coating composition comprising an aqueous emulsion of a mixed resin composed of from 70 to 98% by weight of a water insoluble drying oil modified alkyd resin of acid number below 15 and from 2 to 30% by weight of a rosin-maleic acid resin of acid number below 40. No. 2,272,057. Harold C. Cheetham to The Resinous Products Co.

Dyes, Stains

Methine dyestuffs. No. 2,272,163. John D. Kendall to Ilford, Ltd.

Equipment—Apparatus

Apparatus for purification of gases by removal of suspended particles contained therein. No. 2,271,642. Hans Holzwarth to Holzwarth Gas Turbine Co.

Liquid homogenizing device. No. 2,271,982. Arnold van Kreveld to Coop. Condensfabriek "Friesland."

Explosives

In fractionating starch nitrate, the method which comprises dissolving starch nitrate in part in a solvent mixture consisting largely of hydrocarbon diluent and substantially anhydrous methanol and separating the resulting solution from the undissolved material at a temperature of approximately 50°C. No. 2,271,877. Walter Snelling and George Rees to Trojan Powder Co.

Fine Chemicals

Photographic silver halide emulsion sensitized with cationic surface active ammonium salt. No. 2,271,623. Burt H. Carroll to Eastman Kodak Co.

A growth promoting substance having the structure represented by the formula:

$$CH_2OH—\underset{\displaystyle CH_3}{\overset{\displaystyle CH_2OH}{\overset{|}{\underset{|}{C}}}}—CHOHCO—NH—CH_2CH_2COOH$$

No. 2,271,872. Herschel Mitchell to Research Corp.

In method treating a photograph having an emulsion layer carrying a photographic image and a supporting layer of transparent cellulosic material, the improvement for coloring said photograph by staining said supporting layer without staining said emulsion layer which comprises applying to the surface of said supporting layer a solution of dye of desired color in a solvent comprising an aqueous solution of acetic acid and a sulfonation product wetting agent. No. 2,272,117. Carl A. Hasslacher and Henry W. Rimbach to Technico, Inc.

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U. S. Chemical Patents

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Process for manufacture of hexahydropseudoionone which comprises hydrogenating pseudoionone in presence of a noble metal hydrogenation catalyst at temperature of at least 50°C. and at a pressure substantially above atmospheric. No. 2,272,122. John Lee.

Industrial Chemicals

Treatment of waste pickling liquors. No. 2,271,524. Leroy F. Marek to Arthur D. Little, Inc.

In method for concentration of stick water by evaporation, where evaporation is effected by contact of stick water with heated surfaces, the step of contacting the heated surfaces with a liquid material containing fish proteins and alum whereby scale formation is inhibited or removed. No. 2,271,605. Henry L. Pollard to Western Condensing Co.

Process which comprises reacting higher fatty acid glyceride with a saturated aliphatic monohydric alcohol having less than 5 carbon atoms in the presence of a small amount of an alkali metal hydroxide under substantially anhydrous conditions, said hydroxide being added in an amount of 0.1% to 0.5% by weight based upon the glyceride and amount of alcohol employed being not more than 1.75 equivalents of the glyceride. No. 2,271,619. George B. Bradshaw and Walter C. Meuly to E. I. du Pont de Nemours & Co.

In manufacture of purified wool grease from a crude wool grease contaminated with insoluble impurities and suint, the process comprising mixing with said crude wool grease an aqueous solution of an abietic acid salt, and separating resulting aqueous phase and associated insoluble impurities from the wool grease. No. 2,271,-621. Charles R. Brown to The Sharples Corp.

Method for fractionating fluid mixture in a fractionating column. No. 2,271,671. Joseph P. Wible to The United Gas Improvement Co.

In process of production of dichlorinated aliphatic ketones from monochlorinated aliphatic ketones, the step which comprises chlorinating a solution of monochlorinated aliphatic ketone in the presence of a chlorination catalyst at approximately the boiling point of the monochlorinated aliphatic ketone-containing solution. No. 2,271,-705. Glen H. Morey to Commercial Solvents Corp.

Wetting agent. No. 2,271,707. Ferdinand Munz and Otto Trosken to General Aniline & Film Corp.

Method making sodium phosphate from phosphoric acid obtained by digestion of phosphate rock with sulfuric acid in which phosphoric acid is neutralized at least to disodium phosphate state by means of sodium bases. No. 2,271,712. George A. Pierce to E. I. du Pont de Nemours & Co.

Method improving the taste and flavor of a low grade liquor, comprising placing a charge of activated carbon, previously impregnated with the desirable flavor and taste giving esters, in the liquor to be improved, and causing the dissipation of said esters into the treated liquor due to their displacement by impurities absorbed by the carbon from the treated liquor. No. 2,271,797. Worth Goss.

Method of treating mercaptothiazoles with ammonia derivatives. No. 2,271,834. Edward Carr to The Firestone Tire & Rubber Co.

Process recovering hydrogen halide from a gas mixture containing the same and organic vapors produced in the reaction of a halogenated organic compound with an organic compound. No. 2,271,-866. Thomas Liston to Allied Chemical & Dye Corp.

Dibutyl ethers of the polyethylene glycols having from four to six ethylene glycol units in the molecule. No. 2,271,873. Granville Perkins and Thomas Carruthers and Jared Clark to Carbide and Carbon Chemicals Corp.

In purification of used hydrocarbon oils, the process comprising mixing the oil to be purified with an aqueous alkaline reagent and thereby effecting the dispersion of the alkaline reagent in the oil, thereafter subjecting the mixture to an evaporating operation to concentrate the reagent by removing a substantially large part of the water contained therein, and finally separating said alkaline reagent and impurities from the oil by subsidence. No. 2,271,882. Charles Ambler, Jr., to The Sharples Corp.

Process for the polymerization of gaseous olefins to liquid hydrocarbons. No. 2,271,942. Emil Keunecke and Herbert Grasshof to William E. Currie.

Composition of matter comprising an abietic acid substance selected from the group consisting of abietic acid and abietic acid esters characterized by a hydrogen content higher than the ordinary substance but less than complete saturation with hydrogen; and the presence of combined sulfur chloride. No. 2,271,947. Arnold Morway and John Zimmer to Standard Oil Development Co., a corp. of Del.

Process preparing alkyl aluminum halides higher than the methyl derivatives comprising contacting a fluid containing an olefine and hydrogen with an aluminum halide in intimate association with a material selected from the group consisting of metallic aluminum and activated metallic aluminum. No. 2,271,956. Robert Ruthruff.

Nitrogenous condensation products. No. 2,272,012. Walter Kern and Richard Tobler to Society of Chemical Industry in Basle.

Coating undesirably pure monocalcium phosphate for heat treatment. No. 2,272,014. William Knox, Jr., to Victor Chemical Wks.

Cyclic acetal. No. 2,272,153. Clarence L. Moyle to The Dow Chemical Co.

Metals, Alloys

In process for manufacture of metallic magnesium from dolomitic materials containing calcium and magnesium, the steps of calcining material, slaking calcined material, effecting separation between calcium and magnesium contents to yield calcium and magnesium oxides, utilizing the calcium oxide for manufacture of calcium carbide subjecting the magnesium oxide to thermal reduction with calcium carbide to yield metallic magnesium and residue containing calcium oxide, and returning said residue to process. No. 2,271,-626. Neil R. Collins and Gunter H. Gloss to Marine Magnesium Products Corp.

Copper-base alloy comprising about 8.5% aluminum, about 0.75% silicon, about 1% lead, about 1% manganese, and the balance substantially all copper. No. 2,271,969. Charles Davis and Elmer Munson to The American Brass Co.

In process involving treatment of an aqueous indium-bearing solution to precipitate indium therefrom, the step which comprises treating the solution with metallic aluminum in such manner as to cause a substantially spongy precipitate of metallic indium to be formed. No. 2,271,970. Homer Doran, Meryl Jackson and Alfred Alf to Anaconda Copper Mining Co.

Electric contact element consisting of .05 to 4% beryllium by weight and the balance silver. No. 2,272,063. Franz R. Hensel and Kenneth L. Emmert to P. R. Mallory & Co.

Paper, Pulp

Paper-Sizing medium and process for production. No. 2,271,691. Harald Grasshof and Ernst Schlumberger.

Petroleum

Conversion of hydrocarbon oils. No. 2,271,610. Charles H. Angell to Universal Oil Products Co.

Conversion of hydrocarbon. No. 2,271,617. Wayne L. Benedict to Universal Oil Products Co.

Process for production of gasoline from hydrocarbon oils heavier than gasoline which comprises contacting oil at cracking temperature with a calcined mixture being substantially completely free of alkali metal ions. No. 2,271,618. Herman S. Bloch & Edward C. Lee to Universal Oil Products Co.

Preparation of hydrocarbon polymers and products thereof. No. 2,271,-636. Per K. Frolich to Standard Oil Development Co.

Catalytic cracking of hydrocarbons. No. 2,271,645. Elmer R. Kanhofer to Universal Oil Products Co.

Control of contact catalytic reactions. No. 2,271,646. Louis S. Kassel to Universal Oil Products Co.

Process removing alkyl sulfides from sweet hydrocarbon fluids which comprises contacting said hydrocarbon fluids in a substantially dehydrated condition with a reagent containing a substantial proportion of substantially anhydrous cupric chloride. No. 2,271,665. Walter A. Schulze and Lloyd C. Morris to Phillips Petroleum Co.

Catalytic cracking of hydrocarbon oil. No. 2,271,670. Charles L. Thomas to Universal Oil Products Co.

In art of extracting naphthenic compounds from lubricating oil stocks, the method which comprises mixing lubricating oil stock with a solvent comprising 2-pentanone, 4-hydroxy, 4-methyl, and di-ethylene glycol, dissolving naphthenic components of said stock in said solvent separating the resultant solution from more paraffinic components of said lubricating oil stock, and separating the solvent from said solution. No. 2,271,683. Eddie M. Dons and Oswald G. Mauro, to Mid-Continent Petroleum Corp.

Process separating 2-pentanone, 4-hydroxy, 4-methyl from water which comprises mixing the water and 2-pentanone, 4-hydroxy, 4-methyl with methylene dichloride, separating the resultant solution from the water, and distilling the methylene dichloride from the 2-penta one, 4-hydroxy, 4-methyl. No. 2,271,684. Eddie M. Dons and Oswald G. Mauro to Mid-Continent Petroleum Corp.

Improved well drilling fluid having low gas-cutting tendencies comprising an aqueous suspension of heavy solids to which has been added a modicum of fatty acid of class consisting of coconut oil fatty acid, caprillic acid and castor oil acid. No. 2,271,695. Philip H. Jones to Union Oil Co. of California.

Improved well drilling fluid having low gas-cutting tendencies comprising an aqueous suspension of heavy solids to which has been added a modicum of an ester of fatty acid of class consisting of glycol-oleate, butyl-stearate, and glycerol-monoricinoleate. No. 2,271,696. Philip H. Jones to Union Oil Co. of California.

Regenerative catalyst comprising coprecipitated mixture of oxides of chromium and aluminum in a molecular ration of from 90:10 to 60:40 respectively and an alkali metal compound in amount corresponding to from 2 to 30 atoms of alkali metal per each 100 molecules of said mixed oxides. No. 2,271,751. Gerardus H. Visser and Willem F. Engel to Shell Development Co.

Process for treating hydrocarbons. No. 2,271,761. Clarence D. Coutler and Edwin R. Cox to Southwestern Engineering Co.

Treatment of hydrocarbons. No. 2,271,860. Arthur Goldsby to The Texas Co.

High boiling petroleum product stabilized against formation of acidic and sludge products of oxidation by the addition thereto of a small amount, sufficient only to inhibit oxidation, of the oil soluble condensation reaction product formed by reacting a tri nitrated member of the group consisting of benzene, toluene, cresol, resorcinol, anisole, with a member of the group consisting of naphthylamine and substituted naphthylamines. No. 2,271,940. William James and Everett Fuller to Socony-Vacuum Oil Co.

Lubricating oil of hydrocarbon type containing metal compound of an organic compound containing an unsaturated aliphatic radicle in which the metal is joined directly to carbon. No. 2,272,133. Sol Shappirio.

Liquid hydrocarbon motor fuel containing a minor proportion of a metallo organo diazo compound. No. 2,272,134. Sol Shappirio.

Resins, Plastics

Polyvinyl acetal resin containing a hydroxyl group content equivalent to not more than about 15% by weight of polyvinyl acetate and an acetate group content equivalent to not more than about 5% by weight of polyvinyl acetate, about 60 mole per cent of the acetal groups in the resin being acetaldehyde acetal groups and the remainder of the acetal groups being isobutyraldehyde acetal groups. No. 2,271,668. Donald R. Swan to Eastman Kodak Co.

Process solubilizing an insoluble heat-gelled drying oil-resin composition, which comprises subjecting said gel to mastication treatment, whereby it is rendered soluble in varnish thinners. No. 2,271,804. Frank Root to Ellis-Foster Co.

Phenol formaldehyde condensation products. No. 2,272,154. Reinhart Muller to Bakelite Corp.

Preparation of phenolic condensation products. No. 2,272,155. Reinhart Muller to Bakelite Corp.

Textiles

Process of printing cellulosic textile materials in resist styles to produce patterns on a colored ground. No. 2,272,810. Denys Milburn to Imperial Chemical Industries, Ltd.

Abstracts of Foreign Patents

Collected from Original Sources and Edited

Those making use of this summary should keep in mind the following facts:

Belgian and Canadian patents are not printed. Photostats of the former and certified typewritten copies of the latter may be obtained from the respective Patent Offices.

English *Complete Specifications Accepted* and French patents are printed, and copies may be obtained from the respective Patent Offices.

In spite of present conditions, copies of all patents reported are obtainable, and will be supplied at reasonable cost.

This digest presents the latest available data, but reflects the usual delays in transportation and printing. We expect to begin reporting German patents in the near future. Your comments and criticisms will be appreciated.

CANADIAN PATENTS

Granted and Published June 10, 1941

Olefine Oxidation process for converting olefines directly into their corresponding olefine oxides by means of air or oxygen under conditions known to be appropriate for good yield of the desired product, characterized by controlling the reaction by the addition of a small amount of a substance taken from the group consisting of an aromatic hydrocarbon, an aliphatic alcohol, a halogenated aliphatic hydrocarbon, a halogen, an aromatic base, and an organometallic compound. No. 397,030. Ernst Berl.

Cellulose Derivative production process for the preparation of cellulose derivatives having an increased affinity for acid dyestuffs and a reduced inflammability, which comprises reacting cellulosic material with a reagent which contains, besides the group which reacts, an O=CO group and a reagent containing, besides the reactive atom or group, a non-acidic group containing nitrogen. Henry Dreyfus.

Beverage Processing method for producing stabilized products which comprises treating the material with a non-toxic monochloracetic acid compound, whereby the flavor of the product is improved and the maturity thereof hastened. No. 397,064. Abraham Schapiro.

Beer Brewing method comprising the step of treating the wort with a small amount of a non-toxic monochloracetic acid compound. No. 397,065. Abraham Schapiro.

Low Carbon Steel two-stage process comprising as the first step the production, by highly oxidizing fining and subsequent subdivision, of steel containing little or no manganese and silicon and a comparatively large amount of dissolved oxygen in the form of FeO, and as the second step the heat treatment of the said subdivided material at a temperature below melting point in order to cause the dissolved oxygen to react with carbon and diffuse in the form of CO. No. 397,068. Sigurd Westberg.

Silicon Steel process for producing silicon steel having a silicon content of 0.15% to 4%, which comprises reducing by hot rolling silicon steel containing carbon substantially within the range of 0.05 to 0.06% to a gauge which lies substantially between 0.06 to 0.11 inch, then carburizing the hot rolled material by giving it a box annealing while the hot mill scale is still on the surfaces so as to reduce the carbon content of said steel to substantially no greater than 0.015%, then further reducing the material in gauge by cold rolling. No. 397,072. The American Rolling Mill Company. (Victor W. Carpenter.)

Classifying Solids of varying particle size, including a fraction of such fine particle size as tends to interfere materially with selective gravitation, which comprises centrifuging an aqueous suspension of such material to deposit centrifugally substantially all but the very finest particle fraction, resuspending the centrifugally deposited fraction in water, and gravitationally settling from the resulting suspension the coarsest particle fraction while maintaining above and removing from the gravitationally settled fraction an aqueous suspension of the intermediate-size particle fraction. No. 397,078. Bird Machine Company. (Sanford C. Lyons.)

Viscose Syrup production process comprising producing an alkali-cellulose blend from acid-sulfite-preliberated cellulose pulp and alkali-preliberated cellulose pulp in approximately equal proportions to not less than about 25% of said first-named pulp relative to the total cellulose content of said alkali-cellulose, xanthating the alkali-cellulose blend, and dissolving the resulting cellulose xanthate to form viscose. No. 397,081. Brown Company. (George A. Richter.)

Zinc Plating process for electroplating zinc from zinc cyanide solution containing alkali metal cyanide and alkali metal hydroxide comprising adding to said solution a soluble sulfide in an amount sufficient to substantially completely precipitate dissolved heavy metals and thereafter electroplating zinc from said solution. No. 397,090. Canadian Industries Limited. (Floyd F. Oplinger.)

Vinyl Resin stabilizer comprising an agent consisting solely of the elements carbon, hydrogen and oxygen and consisting of an aryl ester of an aryl carboxylic acid having a single carbocyclic ring. No. 397,096. Carbide and Carbon Chemicals Limited. (Thomas F. Carruthers and Charles M. Blair.)

K-Strophanthine-Beta production process comprising causing an enzyme preparation containing alpha-glucosidase to act upon glucosides from strophanthus kombé containing more than one molecule of glucose, and separating the k-strophantine-beta by means of chloroform-alcohol. No. 397,098. Chemical Works, formerly Sandoz. (Jany Renz.)

Manganese Alloy characterized by being freely hot and cold workable and which is ductile and strong when cold, consisting of at least 30% manganese containing not more than 0.1% of any of the elements iron, carbon, silicon and aluminum, based on the weight of the manganese present and the remainder of the alloy consisting essentially of copper. No. 397,100. The Consolidated Mining and Smelting Company of Canada, Limited. (James R. Long.)

Austenitic Alloy steel characterized by having the properties of stainless steel and containing from 10-20% chromium, 10-35% manganese, the remainder iron, carbon in quantity not greater than 0.15% and silicon and aluminum in total quantity not greater than 0.15% of the total amount of manganese present. No. 397,101. The Consolidated Mining and Smelting Company of Canada, Limited. (James R. Long.)

Manufacture of Paper containing groundwood by the method comprising making an aqueous solution of acid calcium sulfite, treating the same with lime to form finely divided calcium sulfite and incorporating the latter in paper stock. No. 397,102. Consolidated Paper Corporation, Limited. (Horace Freeman.)

Weld Filler material containing approximately 62-47% copper, 1-6% cadmium, 0.01-0.5% silicon, remainder substantially zinc, the zinc content being at least 20%. No. 397,107. Dominion Oxygen Company, Limited. (Arthur R. Lytle.)

Welding Alloy comprising lead 8-18%, tin 5-12%, zinc 8-15%, silicon 0.05-0.5% and the remainder substantially all copper. No. 397,108. Dominion Oxygen Company, Limited. (Arthur R. Lytle.)

Photographic Emulsion containing a dyestuff component for color forming development fast to diffusion and having a polymeric molecule consisting of a chain of more than two known color forming development components joined together by the reaction with a member of the class consisting of aldehydes, dialcohols and thionylhalides. No. 397,114. General Aniline & Film Corporation. (Wilhelm Schenider.)

Photographic Emulsion containing a cyanide dyestuff containing a fatty acid radicle united in omega-position to the carboxyl-group of said radicle to the nitrogen atom of each of the heterocyclic rings. No. 397,115. General Aniline & Film Corporation. (Oskar Riester and Gustav Wilmanns.)

Egg Whites processing method which comprises whipping the egg whites to a foam and thereafter grinding the dried foam. No. 397,120. Industrial Patents Corporation. (Leon D. Mink.)

Paper Manufacture method which comprises forming a wet paper web, partially drying the same, subjecting the partially dried web to preliminary pressure such that in addition to smoothing surface irregularities the body of the web is consolidated to an extent such that it is substantially unaffected by subsequent calendering, coating and drying, and calendering the web to provide calender finishing of the coated surfaces. No. 397,122. K-C-M Company. (Charles R. Van de Carr, Jr.)

Soldered Wire fabric join in paper machines made by method comprising mixing copper, silver and cadmium in substantially the proportions of 15% copper, 55% silver and 30% cadmium, applying the mixture to the wires to be joined together and then heating the material to form the soldered connection. No. 397,128. The Lindsay Wire Weaving Company. (Donald C. Dilley.)

Abrasive Article production method which comprises applying to a flexible base abrasive grains and a binder, said binder including a phenolic aldehyde type of resin which is heat hardenable and oil soluble per se, admixed with a minor quantity of a drying oil, and heating to cause settling of the binder to a solid, adherent, flexible and water resistant film. No. 397,131. Minnesota Mining and Manufacturing Company. (Richard P. Carlton.)

Alkali Metal Silicates manufacture comprising the steps of mixing a charge of sand and an alkali metal salt having an acid radical capable of being volatilized during the process whereby the temperature is raised at which the charge will form a melt, heating said charge to reactive temperature sufficiently high to volatilize said acid radical but below temperatures producing any visible vitrification of the reaction mixture, for a time sufficient to produce a substantial amount of water soluble silicate, dissolving the soluble silicate from the resulting product and returning the insoluble residues for use in a repetition of the process, the temperatures reached during said heating step exceeding those normally producing the formation of a melt but such formation being avoided by progressive volatilization of said acid radical as the temperature is raised. No. 397,137. The Philadelphia Quartz Company. (Daniel B. Curll, Jr.)

Lead Chromate manufacture by the method comprising adding to lead hydroxide a chromate precipitating reagent. No. 397,140. The Priestman Collieries Limited. (Thomas G. French.)

Polyvalent Metal Soap manufactured from a water solution of an alkali metal soap by the method comprising the steps of emulsifying the water solution of alkali metal soap with a water-immiscible organic solvent, and adding a polyvalent metal salt in solid form to the emulsion to cause a precipitation of polyvalent metal soap which passes into solution in the solvent and breaks the emulsion. No. 397,149. Texaco Development Corporation. (Alton J. Deutser and Roy F. Nelson.)

Plastic Composition of a dough-like consistency comprising a filler of wood flour and a dispersion in a hydrocarbon thinner of a binder including tung oil, an oil-soluble substituted phenol resin and an agent selected from the group consisting of the oxides, hydroxides,

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naphthenates and tungstates of zinc, lead, magnesium and calcium and metallic soaps, said binder being in an advanced state of polymerization characterized by an acetone-insolubility of 30% or more. No. 397,154. Union Carbide and Carbon Corporation. (Robert P. Courtney.)

Purification of Metals of the alkali and alkaline earth groups which comprises dissolving the metal in liquid ammonia, separating the solution thus formed from insoluble impurities, removing the ammonia by evaporation, and pulverizing the porous cake of metal thus obtained. No. 397,155. Union Carbide and Carbon Research Laboratories, Inc. (Thomas H. Vaughn.)

Polystyrene Denture comprising 4 to 8 parts of powdered mica per 100 parts of polystyrene. No. 397,162. United States Rubber Company. (Omar H. Smith.)

Microporous Rubber filtering diaphragm. No. 397,163. United States Rubber Company. (Arthur E. Brooks.)

Recovery of Precious Metals used as catalyst by method comprising passing gases carrying the catalyst through a self-supporting precious metal catalytic mass, and then passing the reacted and unreacted gases through a porous filter constructed of a mass of discrete particles of a material which is refractory at filtering temperatures, said filter positioned at a point where the temperature is maintained above the condensation temperature of any material in the gas stream which is condensable to liquid at normal temperatures and pressures, and recovering the catalyst particles retained within said porous filter. No. 397,175. Baker & Company, Inc. and Hercules Powder Company. (Fritz Zimmermann.)

Cellulose Esters containing sulfur impurities having said impurities removed by a method comprising heating a solution of the cellulose ester, treating the hot solution with a metal selected from the group consisting of copper, zinc and iron in a form presenting a large surface area, and thereafter filtering the hot solution. No. 397,178. Camille Dreyfus. (Camille Dreyfus and William Whitehead.)

Production of Diaminoalcohol of the aromatic series. No. 397,192. Chemische Fabrieken Dr. Joachim Wiernik & Co. A. G. (Gustav Heilner.)

Cation Exchange Resins obtainable by condensing a phenol with an aldehyde containing an acid group and formaldehyde. No. 397,193. I. G. Farbenindustrie A. G. (Hans Wassenegger.)

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Purifying Solvent mixture containing impurities as dust, fibre particles and coloring matter, as recovered in the manufacture of coated materials. No. 397,220. Louis M. Plansoen.

Tree Seedling Pulp made from young tree seedlings including the bark and all other parts with the exception of the roots. No. 397,222. Edward K. Robinson.

Limestone Calcining process comprising first comminuting the limestone to minus 8-mesh, subjecting the limestone to agitation in a calcining chamber, at a temperature of approximately 700° C., excluding air from the calcining chamber, maintaining a complete atmosphere of steam in said calcining chamber until CO_2 component of the limestone is substantially completely dissociated from the CaO component. No. 397,244. American Zinc, Lead and Smelting Company. (Walter H. MacIntire.)

Resinous Composition resistant to discoloration under the influence of heat and oxygen and which contains as essential ingredieints the resinous material obtained by condensing formaldehyde with a hydrolysis product of polyvinyl ester and in addition thereto, a small amount of ortho-hydroxymethyl phenol. No. 397,250. Canadian General Electric Company, Limited. (Birger W. Norlander.)

Cellulose Hydroxyalkylation process comprising slowly introducing a stream of vapors of an alkylene oxide into a cellulose within a zone under subatmospheric pressure maintained at a temperature within the range from around atmospheric to around 60° C., in the presence of vapors of a tertiary amine catalyst, and regulating the rate of introduction of the alkylene oxide to that of its rate of reaction with said cellulose to prevent the pressure in the said zone from rising substantially above around atmospheric pressure, the total amount of alkylene oxide introduced into the said zone being between 1% and 30% of the weight of the cellulose. No. 397,286. Carbide and Carbon Chemicals Limited. (Aubrey E. Broderick.)

Ore Reduction apparatus. No. 397,288. Clarkiron, Inc. (Walter G. Clark.)

Distilling Apparatus for fatty acids. No. 397,291. Colgate-Palmolive-Peet Co. (Martin H. Ittner.)

Insecticide Compound comprising a salt of an inorganic acid having a fluorine-containing anion with a polymeric amino-nitrogen-containing substance, which polymer is insoluble in water and in a 5% aqueous ammonia but soluble in 2% aqueous acetic acid, and is capable of being formed into a coherent film. No. 397,297. E. I. du Pont de Nemours & Co., Inc. (Paul L. Salzberg.)

Photographic Emulsion of the silver halide type containing a dyestuff component fast to diffusion, said dyestuff component being capable of forming a dye with the oxidation product of a developer and containing in its molecule a radicle having substantially the chemical structure of a compound of the cyclic menthane series. No. 397,304. General Aniline & Film Corporation. (Gustav Wilmanns and Wilhelm Schneider.)

Anhydrous Magnesium Chloride production process comprising spray-drying the higher hydrates of magnesium chloride, thereby producing lower hydrates, and treating the latter with chlorine in the presence of carbon at temperatures adequate for converting them into anhydrous magnesium chloride. No. 397,316. Magnesium Elektron Limited. (Walther Schmid, Fritz Wienert and Hans G. L. von Stocmeier.)

Absorbent Agent produced from sodium silicate and acid-reacting aluminum salt. No. 397,324. Purdue Research Foundation. (Henry R. Kraybill, Pearl H. Brewer and Max H. Thornton.)

Naphthenic Resin comprising a modified alkyd resin in which a naphthenic group of a petroleum naphthenic acid is combined with the alkyd resin No. 397,334. Standard Oil Development Company. (Per K. Frolich.)

Cellulose Composition clear and homogeneous comprising a compound consisting of a cellulose ester of an aliphatic organic acid and not more than approximately 20% of a substantially saturated, linear, aliphatic isoolefin polymer having an average molecular weight above 800 as determined by the viscosity method. No. 397,335. Standard Oil Development Company. (Robert P. Russell.)

Coating Process for textiles which comprises mixing together cellulose derivative, plasticizer therefor and a swelling agent for the cellulose derivative until complete conversion has taken place and the swelling agent has been substantially completely removed, and thereafter transferring the completely converted mixture of the cellulose derivative and plasticizer to the calendering rolls, and uniting the said converted mixture to a base material in the substantial absence of solvent for the cellulose derivative. No. 397,348. Camille Dreyfus. (George Schneider.)

Finishing Textile material containing filaments or fibres of cellulose acetate which have been dyed, which comprises subjecting such textile material to the action of dry heat at a temperature of 150-180° C. for such period of time as to increase the fastness of the dyeing. No. 397,349. Camille Dreyfus. (Herbert Platt and Richard R. Sitzler.)

Coated Textile material prepared by the method comprising preparing a mixture of mixed ester of cellulose, a plasticizer therefor and a volatile swelling agent for said mixed ester of cellulose, in the form of a homogeneous viscous gel, working the mixture at a temperature above the boiling point of the swelling agent until substantially all of the swelling agent is removed and then applying the mixture of mixed ester and plasticizer with heat and pressure to a textile material. No. 397,350. (Camille Dreyfus, George Schneider.)

Corrosion Preventive composed of an alkali metal salt of oil-soluble sulfonic acid obtained by treating petroleum oil with concentrated sulfuric acid and degrás. No. 397,352. Stanco Incorporated. (Robert B. Lebo.)

Coloring Metal of the ferrous type. No. 397,355. Ernest A. Walen and Fowler W. Wilbur.

Maize Straw decomposition method adapted to produce straw for textile purposes characterized by the essential feature that the material is subjected, if desired with the application of pressure, to a process of boiling with alkali and substance which split off ammonia under the influence of alkali, e. g. urea, whereupon, after washing away the parts that are then soluble, the remainder thereof is dried and squeezed simultaneously and then further worked up mechanically. No. 397,359. Friedrich Baudisch.

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Sulfur Dioxide production by oxidizing sulfur in a combustion chamber, withdrawing the gases therefrom and cooling them indirectly with air at a point distant from the combustion chamber. No. 397,361. Carl Skoldebrand and Albert D. Merrill.

Magnesium alloy production by adding to molten magnesium an amount lying between the range of 3-14% of a pre-alloy of the following formula: aluminum 44-33%, zinc 24.5-41%, manganese 2-4%, nickel 3.5-8%, magnesium 26-17%. No. 397,372. Fritz Christen.

Insect destroyer made of metal and adapted for entrapping insects. No. 397,373. John R. Diffinbaugh.

Carbon disulfide production method in which a column of charcoal is charged into a retort and elemental sulfur is introduced into the base thereof. No. 397,388. Otto Saladin.

Copper alloy comprising from a small but effective amount up to 5% cobalt from a small but effective amount up to 5% iron, from a small but effective amount up to 3% silver, with the balance substantially all copper. No. 397,429. Canadian Westinghouse Company Limited. (James M. Kelly).

Copper alloy comprising from about 0.5% to 3% cobalt, from about 0.5% to 3% iron, from about 0.05% to 0.5 beryllium, and the balance substantially all copper. No. 397,430. Canadian Westinghouse Company Limited. (James M. Kelly).

Paper coating method using an excess of fluent coating composition. No. 397,434. The Champion Paper and Fibre Company. (Donald B. Bradner).

Cast iron welding rod containing 2.75-3.15% carbon, 2.25-3.5% silicon, 0.5-1% manganese, at least one metal of the group consisting of vanadium and chromium, the sum of the vanadium percentage and one-half the chromium percentage being between 0.05 and 0.5%, the remainder principally iron. No. 397,441. Dominion Oxygen Company Limited. (Charles O. Burgess).

Electro-welding flux containing as essential ingredients an oxydic compound of titanium and an oxydic compound of zirconium so proportioned that the ratio of titanium oxide to zirconium oxide is between 1.5 and 2.5. No. 397,442. Dominion Oxygen Company Limited. (Wilbur B. Miller).

Rubber treating method comprising incorporating in rubber prior to vulcanization a 2-mercapto-alkyl-substituted dihydropyrimidine compound. No. 397,443. Dominion Rubber Company Limited. (William Pieter terHorst).

Cellulose fiber stabilization against deterioration which comprises treating the same with an acidyl-amino diarylamine. No. 397,445. Dominion Rubber Company Limited. (William Pieter terHorst).

Silver alloy for use in contact with hot phosphoric acid composed of a silver base containing a small but effective amount of silicon imparting high creep strength at elevated temperatures below 400° C. No. 397,450. Electro Metallurgical Company of Canada Limited. (Augustus B. Kinzel).

Indelible dyestuff, substantially non-toxic, comprising a dihydroxy dicarboxy fluoran, characterized by the presence of a hydroxy and a carboxy radical attached to each of the benzene rings that are linked by means of an oxygen bridge. Max Factor & Co. (Paul W. Jewel and John R. Pratt).

Ice glazing of frozen flesh foods. Nos. 397,453 and 397,454. Fisheries Research Board of Canada. (Robert H. Bedford).

Liquid fuel comprising equally distributed coal particles suspended in fuel oil. No. 397,455. Fuel Research Corporation. (Albert L. Stillman).

Photographic emulsion comprising a silver halide emulsion containing as a color development component bis-2-methyl-benzthiazole-dimethyl sulfate. No. 397,458. General Aniline & Film Corporation. (Wilhelm Schneider and Hans Loleit).

Powdered metal production by reducing particles of a compound of a metal with a hot gas reducing agent without substantial fusion. No. 397,461. Hardy Metallurgical Company. (Charles Hardy).

Plasticized polyvinyl acetal resin suitable for use as interleaf for safety glass comprising a polyvinyl butyral resin of less than 25% hydroxyl groups figured as alcohol, butyl laurate, and a phthalate of a monohydric alcohol of less than 8 carbon atoms. No. 397,476. Monsanto Chemical Company. (Elmer R. Derby).

Additional Canadian Patents granted and published June 24, 1941 will be given next month.